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MONTANA WATER PLAN

FINAL

December 1990

Section: Drought Management

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WATER RESOURCES DIVISION • DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

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INTRODUCTION

Montana's water supplies vary from year to year. Some years there is too much water and flooding occurs. In other years, there is too little water and drought results. Drought is an inevitable part of Montana's climate. It will happen again as it has happened in the past.

Most Montanans understand that drought is inevitable. This does not mean that they can do nothing to reduce drought effects. Although the state may not be able to make it rain or snow, it can help its citizens prepare for and minimize the effects of drought.

The questions are whether, how, and when the state should use its authority to ease the effects of drought. This section of the state water plan proposes an answer to these questions. A policy is proposed that defines the proper role of the state in drought management. Then, this plan section recommends specific actions to fulfill that role.

BACKGROUND

Drought threatens all water needs. Dryland agriculture is particularly vulnerable. Drought also increases the threat of wildfire. These drought-related impacts arise primarily from soil moisture deficiencies. However, the most controversial drought issues typically surround the use of water from our streams, lakes, and aquifers.

The prior appropriation doctrine determines who gets to use scarce water from these sources. This doctrine of "first in time is first in right," which will continue to be the basis for water allocation and use in the state, assigns priority to water uses based solely on the date of appropriations. Given the unadjudicated status of most water rights in Montana, drought presents several problems for Montana water users. These problems include: (1) procedural difficulties in enforcing unadjudicated water rights; (2) the expense of beginning to enforce water rights in areas that historically lacked enforcement; (3) a lack of water conservation incentives in the law; and (4) legal restrictions and practical difficulties associated with changes in the use of water rights.

Under these circumstances, how can important water uses be protected? In extreme, life-threatening emergencies, the government has the authority to take water rights, with pay, to protect the public good. Such a situation is better avoided. Less intrusive ways to cope with the effects of drought, or possibly to prevent them, are preferred.

Another approach is to better inform water users about the probability of drought. Where drought appears likely,

water users may be asked to consider options that would minimize their risk and extend limited water supplies. This approach requires planning. Planning may also reduce the vulnerability of agriculture and forests to drought. Because drought occurs with greater warning and frequency than other kinds of disasters, planning has great promise for reducing its effects.

Much was learned in recent years about the types of impacts and conflicts that are likely during drought. Perhaps the most important lesson is that the best time to reduce the impacts of drought is before they happen. Recent experience has shown the need for a larger box of tools to prevent and mitigate drought-related problems.

POLICY STATEMENT

It is the policy of the State of Montana to support proactive drought management at the local level to protect the natural resources, economic base, and lifestyles of Montana citizens. This policy requires programs for drought monitoring, assessment, preparedness, mitigation, and assistance.

The state must consider the needs of all water users during drought, including dryland and irrigated agriculture; municipal and rural water suppliers; energy producers; mining and mineral processing, forest products, tourism, recreationists, and recreation-based businesses; and individual water users. Incentives should be provided for all water users to act to prevent or reduce the effects of drought. State technical and financial assistance should be provided to water users in a consistent and predictable manner. Water users should consider the risks posed by drought when making major management decisions and should know what to expect from government if drought occurs.

ISSUES, OPTIONS, AND RECOMMENDATIONS

Eight functions are identified as necessary for accomplishing the state's proactive drought management policy. The issues are how to accomplish these eight functions.

Issue 1 - Drought Monitoring and Early Warning

Drought monitoring means collecting data, analyzing it, and reporting on the probability and severity of drought. Several government agencies and a few private entities are involved. Current monitoring efforts can be improved to provide better early warning of drought conditions.

One useful tool for monitoring drought is the Palmer Drought Index (PDI). The PDI is valuable as a measure of soil moisture and its availability to meet the needs of dryland crops and rangeland forage. The PDI is calculated weekly by the National Weather Service for seven broad regions of Montana. These regions are so large that some locally severe drought conditions go unreported. Also, the PDI is not a good predictor of streamflows, particularly in mountainous regions where runoff depends primarily on snowmelt. An alternative index, known as the Surface Water Supply Index (SWSI), is being developed to forecast streamflow conditions in such areas. In Montana, both the PDI and SWSI may be used for drought early warning and monitoring. The SWSI is applicable to water users dependent on streamflows, and the PDI is applicable to dryland agriculture.

Questions arise as to how monitoring information should be compiled and made accessible. Who should be responsible? Should monitoring efforts be intensified as drought conditions appear likely?

Options

1. Improve monitoring of soil moisture.
2. Pursue the calculation of the PDI for smaller geographical areas.
3. Encourage the continued development and revision of basin-specific SWSIs.
4. Improve coordination in the collection, interpretation, and reporting of the PDI, SWSI, and other drought forecasting and monitoring information. This information must be passed on to people in time for them to make decisions to reduce their vulnerability to drought.

Recommendations

Options 2, 3, and 4 are recommended. Option 1 was considered desirable, but rejected on the basis of potential manpower and cost-related problems.

Issue 2 - Impact Assessment

Drought impacts are assessed by using the monitoring information to predict economic, environmental, and social costs. Assessments may be prepared on the drought-related impacts to: (1) specific crops and livestock, (2) tourism, (3) energy production, (4) domestic water supplies, (5) wildfire, and (6) fish and wildlife.

Options

1. Support research applicable to specific Montana locations on the relevance of water availability to

crop and livestock production, tourism, energy production, the quality of domestic water supplies, wildfire potential, and fish and wildlife production.

2. Develop economic models that can compare the value of water for various uses in the economics of specific areas in Montana.
3. **Coordinate the efficient and timely assessment of impacts related to various water uses. A list of the individuals with the expertise to assess impacts should be maintained.**

Recommendation

Option 3 is recommended. While basic research is strongly supported, Option 1 was rejected as being too vague to be implemented. The economic information derived under Option 2 would also be useful, but this option was rejected to avoid creating the false impression that the state is interested in reallocating water based on economic values.

Issue 3 - Coordination of Governmental Actions

Coordination is essential to properly administer programs for drought monitoring, impact assessment, assistance, education, and mitigation. Presently, the vehicle for drought management coordination is the 1985 Montana Drought Plan. This plan designates the Disaster Advisory Council as responsible for providing coordination. However, the plan and the Disaster Advisory Council are only activated after a drought situation emerges. This is contrary to the proposed proactive drought policy. Further, the coordination provided by the plan is vague with respect to drought monitoring, management decision making, assistance, education, and mitigation. There is little knowledge of, or adherence to, the plan by most other drought-affected government agencies or the general public.

Options

1. **Replace the current drought plan, by directive of the governor, with a document that incorporates the recommendations of the state water plan.**
2. Expand the Disaster Advisory Council to include federal, local government, and private representation.
3. Create a permanent Drought Monitoring Committee responsible for forecasting drought conditions. This committee would advise the governor of the need to activate the Disaster Advisory Council. The Drought Monitoring Committee would have authority to:
 - a. review and report drought monitoring information.

- b. identify those areas of the state with a high probability of drought and target reporting and assistance efforts to those areas.
 - c. upon request, appoint and organize local drought advisory committees for those areas. Committee membership should be comprised of state and local government officials, including conservation districts; and local water user groups, including dryland and irrigated agriculture, municipal and rural water suppliers, energy producers, mining and mineral processing, forest products, tourism, recreationists and recreation-based businesses, and individual water users.
 - d. assign state agency staff to provide technical assistance to local drought advisory committees.
4. Provide specific criteria for activation of the Disaster Advisory Council, other than a governor's directive.
 5. Reassign responsibility for state drought management coordination from the Disaster Advisory Council to a permanent Drought Advisory Committee. The Drought Advisory Committee would be chaired by a representative of the Governor's Office and representatives of each of the other agencies previously represented on the Disaster Advisory Council, though not necessarily the directors of those agencies. Non-voting representatives of federal and local governments and public and private interest groups should also be appointed. The Drought Advisory Committee would have authority to:
 - a. review and report drought monitoring information.
 - b. identify those areas of the state with a high probability of drought and target reporting and assistance efforts to those areas.
 - c. upon request, appoint and organize local drought advisory committees for those areas. Committee membership should be comprised of state and local government officials, including county disaster services coordinators and conservation district supervisors; local water user groups, including dryland and irrigated agriculture, municipal and rural water suppliers, energy producers, mining and mineral processing, forest products, tourism, recreationists and recreation-based businesses, and interested citizens.
 - d. request state agency staff to provide technical assistance to local drought advisory committees.

Recommendations

Options 1 and 5 are recommended.

Issue 4 - Triggering Mechanisms

The current drought plan uses the Palmer Drought Index to trigger certain drought response activities. With the development of the Surface Water Supply Index, an additional criterion becomes available that is more applicable to surface water users. These criteria may be used to gauge the propriety of certain drought management activities against the severity of the drought conditions.

Triggering mechanisms serve as guides for state action. They are not intended to replace existing procedures based on local conditions and requests. For example, the issue of when to declare a disaster, and when to declare the disaster over, can be controversial. Some recreation-based businesses may oppose the designation, while some farmers and ranchers may want it in order to take advantage of federal assistance programs. This kind of conflict is best dealt with at the local level, with the triggering mechanisms merely serving as guidelines to help in making such decisions.

Options

1. To insure that drought-response efforts correspond to the magnitude of specific drought conditions, the drought plan should recommend specific actions corresponding to numerical indicators of drought severity. Actions should be linked to numerical thresholds as drought conditions both intensify and recede.
2. Both the PDI and the SWSI should be used as triggering mechanisms. The PDI should be used to indicate drought severity to dryland agriculture, and the SWSI to forecast and measure the severity of drought for surface water users. Other drought monitoring information should also be considered. If this information indicates that the PDI or the SWSI are not accurate indicators of drought severity, actions should be taken earlier or later than the triggering mechanisms would suggest.

Recommendations

Both options are recommended.

Issue 5 - Assistance Programs

Assistance programs are programs available immediately prior to, during, and after a drought. Some of these programs are reactive, rather than preventive, in nature. Federal assistance programs are primarily geared to providing financial assistance, while state assistance programs generally provide technical assistance. The federal government administers the crop insurance program, which allows farmers to protect themselves financially against drought losses. Other federal programs are activated when a disaster is declared by the president or the chief executive officer of the responsible federal agency. Although the majority of these programs are geared to agricultural users, there are a limited number of programs for other types of assistance needs.

Options

1. Expand the types of technical and financial assistance provided to all victims of drought, filling the gaps left by federal financial assistance programs.
2. Update the list of available state and federal assistance programs in the state drought plan.
3. Provide technical and financial assistance to local drought advisory committees for promoting local drought preparedness.
4. Oppose elimination of the federal crop insurance program, and support changes in this program that will make it more efficient and attractive to producers.

Recommendations

Options 2, 3, and 4 are recommended. Option 1 was rejected as being too vague and politically impractical.

Issue 6 - Funding for Drought Management Programs

Drought monitoring, assessment, education, mitigation, and assistance all cost money. The issue is how to pay for improved state drought management. Some improvement in drought management programs may be possible by reallocating and better utilizing existing resources. Significant improvements are unlikely without additional funds.

Options

1. Reallocate and better utilize existing staff and operating budgets.
2. Apply for grant funding from the Montana Water Development Program, Renewable Resource Development Program, or other state or federal sources for a pilot drought management program.

3. Seek a direct legislative appropriation of funds.

Recommendations

Option 2 is recommended. Option 1 is recommended as a fallback position if grant funding does not materialize. Option 3 was rejected as unrealistic in light of the state's current budget problems.

Issue 7 - Research and Educational Programs

Many educational opportunities are available on how to prepare for drought through the Cooperative Extension Service, the Soil Conservation Service, the Bureau of Reclamation, local conservation districts, and other agencies. Some people may not know this information exists. A water education program called the "Montana Watercourse" is established at the Water Resources Research Center in Bozeman. This program provides information to adults and also develops a training program and curriculum for school teachers to teach Montana's children about water resources and its management.

Research is ongoing in a number of areas to find ways to reduce drought impacts, particularly those suffered by agriculture. One example is research to develop more drought resistant varieties of crops.

Options

1. Encourage the use of existing water educational programs, including those of the Extension Service, Soil Conservation Service, conservation districts, and the Montana Watercourse.
2. Support ongoing research into ways to improve drought monitoring, assessment, and mitigation.
3. Publish and distribute a comprehensive annotated directory of available educational resources about water conservation.
4. Better utilize the media and other means of communication for informing the public about drought management options and activities.

Recommendations

All of the options are recommended.

Issue 8 - Drought Mitigation Strategies

Drought mitigation strategies are potential options or improvements to ongoing water management activities that would, over the long term, reduce the adverse effects of drought.

Options

1. Amend the law to allow emergency water right transfers with expedited state review.
2. Allow utilities to invoke temporary water rate hikes to encourage emergency water conservation measures.
3. Use weather modification technology where it is feasible.
4. Increase the educational emphasis given to the watershed-related aspects of forest and range management, managing plant and tree ground-cover to minimize drought impacts.
5. Provide county governments, conservation districts, or water conservancy districts the emergency authority to implement and enforce local drought plans.
6. Inventory and review operating plans of all existing reservoirs in water-short basins to encourage reservoir operators to adequately consider drought contingencies.
7. Inventory and review the operating plans of state-funded reservoirs to insure that these plans address drought contingencies. Where no operating plans exist for these reservoirs, such plans should be developed and implemented. Also, these reservoirs should be rehabilitated to operate at design capacity and improve the state's capabilities to respond to drought consistent with State Water Plan recommendations for the rehabilitation of water storage projects.
8. Establish stronger economic and other incentives for private investments in water conservation.
9. Consider feasible water storage where it will increase water supply security.
10. Consider basin closure by petition of local water users, as provided by law, to preclude over-appropriation and further aggravation of water shortage situations.
11. Encourage voluntary water conservation by domestic, municipal, and industrial water users.
12. Clarify state law so that water right holders who conserve water are clearly allowed to sell or lease the salvaged water in a manner that does not adversely affect existing water users.
13. Improve water use and conveyance efficiencies in agricultural, municipal, and industrial systems where such improvements will not adversely affect groundwater supplies or return flows needed by other water users.
14. Clarify state law to clearly allow the voluntary, temporary changes of private water rights and contract water exchanges. Such changes could reallocate water to highly valued offstream and instream water uses, whose users anticipate water short years. Such reallocations would be regulated by the state to insure the protection of other potentially affected water users and would have to be planned well in advance of the anticipated dry years.
15. Urge the Board of Natural Resources and Conservation to adopt rules where the installation of water measuring devices will significantly help to resolve conflict and improve the distribution of water during drought in water-short drainages.
16. Find ways to expedite the resolution of local water use conflicts and water rights enforcement during drought before the general adjudication process is completed.
17. Develop a model water conservation ordinance or contract clause for adoption by municipalities and rural domestic water suppliers.

Recommendations

Options 4 and 6 through 17 are recommended. Option 1 was rejected because the committee felt there was no way to expedite the water right change process without compromising the protection of other water right holders. Options 2 and 5 were rejected because these authorities already exist. Option 3 was not believed to be a viable drought management tool at this time.

PLAN IMPLEMENTATION

Legislative Action

First, the legislature needs to clarify the planning and coordination responsibility for drought response. The Division of Disaster and Emergency Services should continue to be responsible for disaster declaration and emergency response activities, while the Drought Advisory Committee would assume responsibility for planning and coordinating drought preparation activities. Second, the legislature needs to clarify that the water rights change statute allows voluntary, temporary water right changes that would not adversely affect other water users. Third, the legislature needs to clarify that water right holders who salvage water through conservation retain the right to sell or lease that water.

Administrative Action

Calculating the Palmer Drought Index for smaller geographical areas should be the responsibility of the State Climate Center at Montana State University. The Soil Conservation Service should continue to develop and refine the Surface Water Supply Index. Coordination in reporting drought monitoring information should be the responsibility of the Department of Natural Resources and Conservation (DNRC), in cooperation with the Montana Water Information System in the State Library. The DNRC would report drought information using computer generated maps prepared by the Montana Water Information System. The reporting effort should make better use of the media and other available means of communication, such as computer bulletin boards.

Once authorized by the governor and the legislature, the Drought Advisory Committee should oversee the development of a new Montana Drought Plan. The new Montana Drought Plan should list individuals with the technical expertise and responsibility to perform drought impact assessments, upon request of the Drought Advisory Committee. This plan should also provide an updated list of state and federal assistance programs and identify the specific triggering mechanisms used to guide drought management actions.

Once a high probability of drought is indicated, the Drought Advisory Committee should consult with the local officials in the drought prone area and offer to provide state assistance to a local drought advisory committee. Local drought advisory committees also may be created in normal years where sufficient interest exists. The DNRC would staff the state Drought Advisory Committee and provide technical assistance to local drought advisory committees. The state Drought Advisory Committee is not intended to have any authority over the local committees. This relationship is necessary merely to ensure coordination between the state and local levels. Existing organizational relationships between state government and local officials (such as the relationship between the DNRC and local conservation districts) should be used to the extent possible to ensure efficient coordination. Local entities, such as conservation districts, should be encouraged to apply for state financial and technical assistance to develop local drought plans at any time.

The publication of an annotated directory of available educational resources about water conservation should be the responsibility of the Montana Watercourse. This program should also promote voluntary water conservation as part of its general educational charge and encourage the use of water education resources in the state.

The Board of Natural Resources and Conservation is urged to adopt rules relating to water measuring devices, as necessary to resolve conflict and improve distribution of water during drought. The way in which water storage will be considered for improving water supply security should be determined in the State Water Plan. The cooperation and assistance of the state Water Court and local district courts should be sought to find ways to expedite the resolution of local water right conflicts during drought.

The responsibility falls to the Drought Advisory Committee, with DNRC staff, to implement all of the other recommendations in this plan section, although other entities will certainly play an important part. These recommendations include suggesting basin closure as an option for local water users, seeking more efficient water use and conveyance by large water users, inventorying and reviewing reservoir operating plans, opposing elimination of the Federal Crop Insurance Program, educating people about management options to reduce drought impacts, and developing a model water conservation ordinance for adoption by municipalities and rural domestic water suppliers.

Financial Requirements and Funding Strategies

A grant is requested from the Water Development Program to establish a pilot drought management program. This grant will be a cooperative endeavor involving the State Climate Office, the State Library, the U.S. Soil Conservation Service, and the DNRC. The grant would provide staff and an operational budget to initiate implementation of the recommendations of this plan section.

A priority use of the grant would be to test the proactive, locally-focused drought management approach if a drought arises during the time when grant resources are available. If no drought develops, the funds will be used to lay the foundation for the use of this management approach when the occasion arises. This foundation includes the production of the new Montana Drought Plan, the establishment of the improved monitoring and early warning system, and the development of educational efforts and various mitigation strategies.

The reallocation of DNRC staff resources and operating expenses is recommended as a fallback method of funding some of the recommendations in this plan section if grant funds are not awarded. The efficient use of existing financial resources, and any available grant funding, is essential to implement this plan section.

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Plan Implementation Summary

<u>Action</u>	<u>Responsibility</u>	<u>Deadline</u>
Issue 1-Drought Monitoring		
Calculate PDI for smaller regions	State Climate Center	January, 1992
Develop SWSI	Soil Conservation Service (SCS)	January, 1992
Improve monitoring coordination	DNRC, State Library	January, 1992
Issue 2-Impact Assessment		
Coordinate timely impact assessments	Drought Advisory Committee	As Needed
Issue 3-Coordination of Government Actions		
Replace State Drought Plan	Governor, Drought Advisory Committee	August, 1991
Define drought management responsibility of Drought Advisory Committee	Legislature	April, 1991
Issue 4-Triggering Mechanisms		
Include triggering mechanisms in new drought plan	Drought Advisory Committee	August, 1991
Issue 5-Assistance Programs		
Update list of assistance programs	Drought Advisory Committee	August, 1991
Assist local drought advisory committees	All State and Federal Agencies	As Needed
Issue 6-Funding Drought Management Programs		
Obtain grant funding	Legislature	July, 1991
Issue 7-Research and Education Programs		
Encourage the use of existing programs	Montana Watercourse, SCS, Extension Service, Conservation Districts, DNRC	Ongoing
Support ongoing research	Montana University System	Ongoing
Publish directory of water conservation information	Montana Watercourse	January, 1992
Develop public information strategy	Drought Advisory Committee	August, 1991
Issue 8-Drought Mitigation Strategies		
Inventory reservoir operating plans	Drought Advisory Committee, DNRC	July, 1992
Consider water storage and basin closure	Drought Advisory Committee, DNRC	Ongoing
Encourage water conservation	Drought Advisory Committee, DNRC	Ongoing
Clarify that state law allows sale or lease of salvaged water	Legislature	April, 1991
Clarify that state law allows voluntary, temporary water right transfers	Legislature	April, 1991
Consider adoption of water measurement rules	Board of Natural Resources and Conservation	October, 1992
Expedite water rights conflict resolution and enforcement	Water and district courts, Drought Advisory Committee, DNRC	Ongoing
Develop a model water conservation ordinance	Drought Advisory Committee, DNRC	August, 1991
Educate about forest and range management options to reduce drought impacts	Drought Advisory Committee, DNRC	Ongoing



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INTRODUCTION

In this plan section, the term “water storage projects” includes the construction of new storage projects and the rehabilitation and expansion of existing facilities. The term also encompasses all three types of storage. Onstream storage refers to facilities that are located on a stream or river and impound only the natural flow of that stream or river. Onstream storage may be located on either mainstem rivers or tributary streams. Offstream storage refers to facilities where the primary water supply is diverted from another water course or storage facility. Finally, nonstructural storage refers to any nonstructural or management activity that affects the timing and flow of water in a natural water course (e.g., groundwater recharge, wetlands enhancement, and watershed management).

Water storage projects provide a variety of benefits to the state of Montana. Among them, reservoirs regulate stream flows for flood control; store water for irrigation, municipal, industrial, and stock water consumption; provide opportunities for flatwater recreation and improved fisheries; and supply water for hydropower generation. Storage facilities, however, can also adversely impact recreation and aquatic and riparian habitat associated with free flowing rivers and alter aesthetic views.

The first storage projects in Montana were built to supply water for mining operations. The homesteaders who followed relied upon small irrigation projects for agricultural development in Montana’s semi-arid climate. As the state’s population grew, so did the size, number, and variety of reasons for constructing water storage projects. By the 1980s, the Soil Conservation Service, the Bureau of Reclamation, the U.S. Army Corps of Engineers, and the Agriculture Stabilization and Conservation Service had combined with state and private entities to develop an estimated 11,000 reservoirs in Montana. Of these, 67 reservoirs store over 5,000 acre-feet of water, while two-thirds of the reservoirs are primarily for stockwater and hold less than 50 acre-feet.

The largest water storage projects (Fort Peck, Canyon Ferry, Hungry Horse, Yellowtail, Libby, and Tiber dams) were built by the federal government. These storage facilities are used for multiple purposes, including irrigation, flood control, hydropower production, and by recreationists who take advantage of the opportunity to swim, boat, fish, and water ski. The state owns several storage projects that were constructed in the 1930s and 1940s with financial assistance from the federal Public Works Administration. Other large dams are single-purpose hydropower facilities owned by private utilities such as the Montana Power Company. A few reservoirs larger than

5,000 acre-feet were built by private groups for irrigation purposes.

It is clear that water storage has and will continue to solve many water resource problems in Montana. However, its applicability is limited by several factors, including the availability of water, technical feasibility, environmental impacts, and funding.

The planning, construction, operation, maintenance, and rehabilitation of water storage facilities is expensive. Water storage projects must often compete for scarce federal and state funds, and their priority must be determined in light of other water management activities.

THE ROLE OF STORAGE IN WATER MANAGEMENT

Montana’s water management problems are diverse and vary according to site-specific conditions. No single water management tool (e.g., water storage, water use efficiency, water right transfers, or conservation) can effectively and efficiently solve all water management problems. The best water management tool for a particular problem should be selected through the following problem-solving process:

1. Define the problem. The water management problem must be adequately and appropriately defined by water users (including municipal, agricultural, recreational, industrial, commercial, and other appropriate users) and technical experts.
2. Identify all the options to solve the problem, including water storage. Potential water storage projects, both new and existing, could be identified: (1) by working with appropriate government agencies and water user groups to review, evaluate, and update existing lists of potential storage projects; and (2) during the process of developing basin-specific plans.
3. Determine whether water is physically and legally available. Existing water rights must not be adversely affected by the water management tool(s) being considered to solve a problem.
4. Select the option that best meets the following criteria:
 - a. Technical feasibility—Does it solve the problem from a technical perspective?
 - b. Financial feasibility—Do the sponsors have the ability to obtain financing and repay any capital investments as well as the associated operation, maintenance, and rehabilitation expenses?

- c. Economic feasibility—Do the direct and indirect benefits, both quantifiable and nonquantifiable, exceed the direct and indirect costs, both quantifiable and nonquantifiable?
- d. Political feasibility—Is it supported by water users, including municipal, agricultural, recreational, industrial, commercial and other affected water users?
- e. Legal feasibility—Can all applicable federal, state, local, and other legal requirements be satisfied?
- f. Environmental feasibility—Does it protect and seek to enhance social, cultural, and ecological values?

Through this problem-solving process, a water storage project could emerge as the best solution to a particular water resource problem. Where that happens, this plan section is designed to facilitate the development of the needed facilities.

This section of the state water plan is divided into three subsections. The first subsection describes how the state should set priorities among water storage projects, allocate state funds among those projects, and ensure that action is taken to complete water storage projects. The second subsection focuses on the financing of water storage projects, while the third subsection addresses the regulatory aspect of developing and rehabilitating water storage projects.

SUBSECTION 1: WATER STORAGE POLICY

BACKGROUND

State water storage policy is to some extent already defined by Montana law. Section 85-1-101(2), MCA declares that *"the public policy of the state is to promote the conservation, development, and beneficial use of the state's water resources to secure maximum economic and social prosperity for its citizens."* Section 85-1-101(4), MCA goes on to say that *"the development and utilization of water resources and efficient, economic distribution thereof are vital to the people in order to protect existing uses and to assure adequate future supplies for domestic, industrial, agricultural, and other beneficial uses."* Finally, Section 85-1-101(6), MCA notes that *"the public interest requires the construction, operation, and maintenance of a system of works for the conservation, development, storage, distribution, and utilization of water, which construction, operation, and maintenance is a single object and is in all respects for the welfare and benefit of the people of the state."*

Although these declarations of policy illustrate the importance of water development and storage to the state of Montana, they do not provide much guidance for selecting which water storage projects to pursue in light of limited state resources. Nor do they ensure that specific actions will be taken by state government to develop priority water storage projects, especially in light of other water management activities.

POLICY STATEMENT

Water storage (including the construction of new projects and the rehabilitation and expansion of existing projects) shall be considered equally with all other practical options in any search for solutions to water resource problems. When the water storage option is determined to be the water management tool that best solves the problem and promotes and enhances the general welfare of the people of Montana, then it should be actively pursued. The pursuit of water storage projects requires a strong and focused commitment by the state. Given the limited resources of the state, priorities must be established among water storage projects in order for the state to be able to make a commitment to the most important water storage projects.

ISSUES, OPTIONS, AND RECOMMENDATIONS

Issue 1 — Prioritizing New Projects

When new water storage projects are selected as the best way to resolve a particular water resource problem, the state faces the question of which projects to focus its limited resources upon. The following options present possible criteria for resolving that question. These criteria are not in any order of priority, recognizing that some may be more important than others on a site-specific basis.

Options

1. Solve the most severe problems.
2. Provide multiple uses and benefits.
3. Provide for public uses.
4. Show strong evidence of broad citizen support.
5. Have the ability to obtain non-state sources of funding.
6. Protect and seek to enhance social, ecological, cultural, and aesthetic values.
7. Improve local and state economic development.
8. Help resolve Indian and federal reserved water rights.
9. Support water conservation activities.
10. Promote the use of water reserved under Montana law.

Recommendation

The priority of new water storage projects should be established according to which projects best satisfy options 1 through 10, realizing that some of the criteria may not apply in some cases.

Issue 2 — Prioritizing Rehabilitation Projects

Several existing water storage projects in Montana are seriously in need of rehabilitation. The rehabilitation of existing projects may also help solve a variety of other water management problems, because projects may be expanded

and improved during rehabilitation efforts. However, it may be difficult to rehabilitate all existing dams due to the cost of such activities.

The estimated cost for rehabilitating several existing water storage facilities in Montana ranges from under \$200,000 to over \$5 million per site. Rehabilitating the Tongue River Dam alone will cost between \$25 million to over \$125 million, depending on the amount of risk to life and property the state and its citizens are willing to assume. The total cost for rehabilitating approximately 35 state-owned high-hazard dams, including the Tongue River Dam, is expected to exceed \$200 million.

In light of the need to rehabilitate existing water storage projects, and the cost of such efforts, the state needs to decide which facilities should be rehabilitated first. One factor affecting the effort to prioritize such projects is the Montana Dam Safety Act. This act defines a “high-hazard” dam as any dam or reservoir that, if it fails, would likely cause a loss of life. The classification of a dam as high-hazard, however, does not determine nor imply whether the dam is structurally safe. Thus, the safety of a particular dam, in addition to its classification as high hazard, must be considered in any scheme to prioritize the rehabilitation of existing water storage projects.

Options

1. **Identify the high-hazard projects most needing repair based on the criteria listed under The Role of Storage in Water Management, those listed in Issue 1, and the following criteria:**
 - a. **Protect public safety**
 - b. **Impacts of not repairing project**
2. Breach high-hazard dams that cannot be repaired with a positive benefit-to cost ratio.
3. Rehabilitate all unsafe high-hazard dams by the year 2000.

Recommendation

Option 1. The priority of rehabilitation projects should be established according to which projects best satisfy the criteria outlined in Option 1, realizing that some of the criteria may not apply in some cases.

Issue 3 — Allocating State Funds

As mentioned above, water storage projects must compete with other water management activities in terms of state and federal assistance. In addition, water storage

projects must compete among each other for limited state and federal financial and technical resources. Although the state has a limited ability to determine how federal resources are allocated, it can set priorities for allocating state funds. The question is, given the amount of state funding available for water storage projects, how should these funds be allocated? A related question, how to increase the amount of state funding available for water storage projects, is addressed in the next subsection on financing water storage projects.

Options

1. Allocate the state funds available for water storage solely to rehabilitate existing water storage projects, particularly unsafe, high-hazard facilities.
2. Allocate the state funds available for water storage solely to plan and construct new water storage facilities.
3. Allocate a certain percentage of the state funds available for water storage for onstream, offstream, and nonstructural types of storage.
4. **Allocate the state funds available for water storage based on the following order of preference:**
 - a. **Resolve threats to life and property posed by high-hazard facilities that are in an unsafe condition.**
 - b. **Improve and/or expand existing water storage facilities.**
 - c. **Plan and/or construct new water storage facilities, including onstream, offstream, and nonstructural.**

Recommendation

Option 4. This approach recognizes the importance of rehabilitating unsafe, high-hazard dams, but also allows for other water storage activities.

PLAN IMPLEMENTATION

Legislative Action

The legislature needs to enact legislation that explains the role of storage in water management, including the generic problem-solving process outlined above. The legislature also needs to enact legislation outlining the criteria for prioritizing new storage projects and rehabilitation projects. The legislation should specify that the Governor's Office, in cooperation with the legislature,

will have final authority for prioritizing all water storage projects.

The legislature also needs to enact legislation specifying that state funds available for water storage should be allocated according to the preferences described above.

Administrative Action

The Department of Natural Resources and Conservation needs to prepare a progress report on water storage activities and submit it to each general session of the legislature. The report should include, at a minimum: (1) the list of

water storage project priorities as determined by the governor and the legislature; (2) an implementation strategy for each priority project that identifies the resources, government actions, and political support needed to accomplish the project; and (3) the status of the priority projects.

Financial Requirements and Funding Strategies

The implementation of this subsection does not require any additional funding beyond that needed for the water storage projects themselves.

Plan Implementation Summary

<u>Activity</u>	<u>Responsibility</u>	<u>Deadline</u>
General		
Enact legislation that explains (1) the role of water storage in water management; and (2) the generic water resources problem-solving process	Legislature	April, 1991
Develop a report on water storage activities each biennium	DNRC	Ongoing
Issue 1 - Prioritizing New Projects		
Enact legislation outlining the criteria for prioritizing new water storage projects	Legislature	April, 1991
Prioritize new storage projects	Governor and legislature	Ongoing
Issue 2 - Prioritizing Rehabilitation Projects		
Enact legislation outlining the criteria for prioritizing the rehabilitation of existing water storage projects	Legislature	April, 1991
Prioritize rehabilitation projects	Governor and legislature	Ongoing
Issue 3 - Allocating State Funds		
Enact legislation outlining the preferences for allocating state funds for water storage projects	Legislature	April, 1991

SUBSECTION 2: WATER STORAGE FINANCING

BACKGROUND

The cost of constructing, operating, maintaining, and rehabilitating water storage facilities varies tremendously depending on their size, location, and site-specific geological and hydrological conditions. In light of this variation, the next several paragraphs illustrate the range of costs, in 1988 dollars, for developing, maintaining, and rehabilitating water storage projects (see Table 1).

The construction costs of existing water storage projects in Montana (excluding small stockwater and fish ponds) ranges from approximately \$50,000 (for Sturgis Dam) to \$258 million (for Yellowtail Dam). The construction costs of the majority of existing water storage facilities falls in the range of approximately \$1 million to \$4.5 million. The cost per acre-foot (based on total storage capacity) ranges from about \$45 (at Canyon Ferry) to \$2,400 (at Pike Creek Dam).

The annual cost for operating and maintaining existing water storage facilities ranges from about one-half to one and one-half percent of the total cost of construction on an annual basis. Rehabilitating and replacing water storage facilities are also expensive. The estimated cost for rehabilitating existing water storage facilities in Montana was outlined in Subsection 1, Issue 2. While historically there have been inadequate funds available for operating and maintaining some water storage facilities, funds are generally unavailable to rehabilitate and replace nearly all water storage facilities.

Finally, the estimated cost of constructing reasonably large new water storage facilities in Montana ranges from nearly \$10 million for the Johnson Creek site (with a firm annual yield of 5,000 acre-feet) to over \$215 million for the Sunday Creek site (with a firm annual yield of 215,600 acre-feet). The annual cost per acre-foot of yield (based on firm annual yield) ranges from \$38 at the Reichle Dam site (with a firm annual yield of 140,000 acre-feet) to \$378 at the Buffalo Creek site (with a firm annual yield of 27,480 acre-feet).

The estimated cost of constructing several much smaller new water storage facilities (ranging in size from approximately 5,000 acre-feet to 25,000 acre-feet) falls in a range of \$1 to \$10 million. The annual cost per acre-foot for these smaller facilities falls into a range of \$100 to \$1,000, with most of them being around \$500. The annual cost per acre-foot for a few water storage facilities, however, has been estimated at less than \$100.

Historically, federal and state governments helped initiate the development of water storage facilities by providing the necessary up-front funds for project planning and construction. Beneficiaries of the completed water storage projects then repaid, in the form of user fees, some or all of the costs attributable to such benefits (i.e., agriculture has generally repaid 10 to 100 percent on specific projects, while hydropower has generally paid 100 percent). Although many water storage projects provide fish, wildlife, recreation, and other environmental benefits, as well as flood control and navigation benefits, these direct benefi-

Table 1. Costs of Water Storage Projects

<i>Existing Projects</i>				
<u>Construction</u>	<u>Cost/Acre-foot (total storage capacity)</u>	<u>Operation & Maintenance</u>	<u>Rehabilitation</u>	<u>Rehabilitation of 35 State-owned Projects*</u>
\$50,000 to \$258 million	\$45 to \$2,400	one-half of 1% of construction	\$200,000 to \$125 million	\$200 million

* This total includes \$125 million for one project, the Tongue River Dam.

<i>New Projects</i>			
<u>Construction of Large Projects</u>	<u>Cost/Acre-foot of Large Projects (firm annual yield)</u>	<u>Construction of Smaller Projects</u>	<u>Cost/Acre-foot of Smaller Projects (firm annual yield)</u>
\$10 to \$215 million	\$38 to \$378	\$1 to \$10 million	\$100 to \$1,000

ciaries have had to pay little of the cost of these benefits (e.g., existing recreational user fees generally do not help pay for the costs of water storage facilities). Rather, these benefits have been paid for largely by the general taxpayer.

Although the federal government's interest in financing water storage projects has recently waned, there are still several funding and technical assistance programs administered by federal agencies such as the Soil Conservation Service's watershed management program and the Bureau of Reclamation's technical assistance program. In addition, the state of Montana administers several programs for funding water management activities, including water storage projects.

POLICY STATEMENT

Financing water storage is an important aspect of water development in Montana. The State of Montana should focus resources on understanding, coordinating, and improving funding programs for water storage development, operation, maintenance, and rehabilitation. Although specific financing packages must be developed on a site-specific basis, all beneficiaries should be considered for a responsible role in repaying the cost of water storage projects. The financial costs of operating and maintaining water storage facilities should be assured prior to construction, and the costs of rehabilitation and replacement should also be considered.

ISSUES, OPTIONS, AND RECOMMENDATIONS

Issue 1 - Information, Education, and Assistance

Although there are a variety of federal, state, local, private, and other sources of funding for water storage projects, it is currently very difficult to find one person or organization that understands all of the programs. As a result, potential project sponsors are unaware of and do not understand the conditions under which financing is available in the various programs.

Options

1. Document existing programs. Creating and updating a directory may facilitate the financing of water storage projects.

2. Provide public information and education on the availability of programs for financing new and existing water storage projects, in addition to the costs and benefits of water storage projects. This campaign would specify what funds are available and under what conditions.
3. Create a committee of diverse interests to facilitate efforts to finance water storage projects. This committee could serve as a clearinghouse for (1) providing public information and education, (2) developing financial packages for funding water storage projects, and (3) coordinating permitting and regulatory issues related to water storage development. This committee might be coordinated and staffed by the Department of Natural Resources and Conservation (DNRC), the Montana Water Resources Association, the Environmental Quality Council, the Water Resources Research Center, or some other organization.
4. Designate a person (in the Department of Natural Resources and Conservation, the Montana Water Resources Association, the Environmental Quality Council, or the Water Resources Research Center) as a "water storage development coordinator" to facilitate efforts to develop water storage projects. This person would serve in the same capacity as the committee described above.

Recommendation

Options 1 and 4. These options are likely to have the greatest impact on financing water storage projects.

Issue 2 - State Water Resource Funding Programs

The Department of Natural Resources and Conservation administers several grant and loan programs for a variety of water management activities, including water storage. One is the Water Development Program (WDP). According to Montana law, "*the water development program is the key implementation portion of the state water plan and shall be administered to accomplish the objectives of the plan*" (Section 85-1-602, MCA). It goes on to say that "*The storage of water for existing and future beneficial uses shall be given the highest priority [for funding] unless a water development project or activity designed to accomplish another objective is demonstrated to be more beneficial to a greater number of people*" (Section 85-1-602, MCA).

A second program is the Renewable Resource Development (RRD) Program. This program provides grants for the development of all types of renewable resources, including water. A third program is the Reclamation and Development Grant (RDG) Program. This program is designed to fund projects that mitigate the impacts of mining or meet other "crucial state needs." It is conceivable that water storage could be considered part of a reclamation program under the "crucial state need" category, but most water storage projects probably fit better under the Water Development Program or the Renewable Resource Development Program. The principle source of funding for each of these programs are taxes on the extraction of non-renewable resources.

The majority of funds potentially available under these funding programs are not allocated to water storage projects for two primary reasons. First, the Montana Legislature has diverted a significant amount of the funds originally intended for these programs to other, ongoing state programs, primarily the administration of state agencies (see Table 2). Since 1984, over \$41 million dollars was deposited in the accounts created for the WDP and RRD programs. However, only about \$19 million was allocated as grants. The trend has been that more and more of the funds deposited in the accounts are being used for other programs, and, consequently, less are available for water projects.

Second, there has been a lack of applications for water storage projects, and, consequently, available funds are allocated to other types of water projects (see Table 3). Of

Table 2. Allocation of Funds Authorized for the WDP, RRD, and RDG Programs

	<u>FYs 1984-91</u>	<u>FYs 1990/91</u>
Authorized	\$41 million	\$15.7 million
Allocated as Grants	\$19 million	\$4.6 million
Used to Fund State Agencies	\$22 million	\$8 million
Used to Fund Water Storage*	\$405,000	\$93,000

* These amounts are included in funds allocated as grants

the slightly more than \$19 million that has actually been available for grants, a total of only about \$400,000 has been used to fund water storage projects. Since the inception of the programs in 1984, a total of 32 applications have been received for loans and grants to fund water storage projects. Twenty-nine of these applications have been completely funded. Under the Water Development Program, six water storage projects have been granted about \$350,000. By contrast, 70 other projects, including municipal and rural water and sewer systems, streambank stabilization, and groundwater studies, have received about \$4 million.

Table 3. Allocation of Grants and Loans from 1984 to 1991

	<u>Water Storage Projects</u>	<u>Other Projects</u>	<u>Total</u>
Water Development Grant Program	\$350,000 (6 projects)	\$4 million (77 projects)	\$4.4 million (83 projects)
Renewable Resource Development Grant Program	\$55,000 (2 projects)	\$3.7 million (62 projects)	\$3.8 million (64 projects)
Water Development Public Loan Program	\$312,000 (3 projects)	\$22 million (46 projects)	\$22.3 million (49 projects)
Water Development Private Loan Program	\$175,000 (1 project)	\$4.1 million (69 projects)	\$4.3 million (70 projects)
Reclamation and Development Grant Program	0	\$10.8 million	\$10.8 million
Total	\$892,000	\$44.6 million	\$45.6 million

Under the Renewable Resource Development Program, 49 projects have been funded at a total cost of over \$1 million. At the same time, only two water storage projects have been funded under this program at a total cost of about \$55,000.

Under the Water Development Public Loan Program (which is financed by the sale of bonds backed by the coal severance trust fund), three water storage projects have been funded at a total cost of about \$312,000. By contrast, 46 other projects have been funded under this program at a total of over \$22 million.

Under the Water Development Private Loan Program (which is financed in part by RRD funds and the sale of general obligation bonds), 70 loans have been approved for a total of \$4.3 million, including one irrigation storage project at a cost of about \$175,000. Approximately \$5.5 million is available each biennium under the Reclamation and Development Grants Program, but to date no water storage projects have been funded.

The issue on financing in the previous section of this plan focused on how to allocate the funds available for water storage. The purpose of this issue is to explore opportunities for increasing the available amount of such funds.

Options

1. Continue public information and education on the availability of funds under these programs.
2. Encourage potential project sponsors to apply for funds.
3. Support legislative and administrative enforcement of the statutory priority for water storage projects under the Water Development Program.
4. **Create a new special revenue account (the "Water Storage Special Revenue Account") to be used exclusively for funding water storage projects as identified and prioritized in Subsection 1, Issue 3, Option 4. The new account would receive 25 percent of each of the Water Development Special Revenue Account and the Renewable Resource Development Account. The funds in the Water Storage Special Revenue Account would be expended as authorized under current water development accounts, including grants, loans, and to underwrite bonds.**
5. If the funds deposited in the new "Water Storage Special Revenue Account" are not used during a given biennium, the funds should be allocated to other state programs.

6. If the funds deposited in the new "Water Storage Special Revenue Account" are not used during a given biennium, the funds should accumulate rather than be transferred to other programs.

7. **Seek authorization for allocating a higher percentage of existing non-renewable resource funds (e.g., coal severance tax revenues) to the development of Montana's renewable resources, particularly water.**

8. Encourage state government to take a more active role in initiating water storage projects.

9. **Authorize the use of 25 percent of the funds over and above the statutory minimum balance of \$100 million on the Resource Indemnity Trust (RIT) Fund for water storage projects.**

10. Delete the \$100,000 cap on Water Development Program Grants for water storage projects, as currently outlined in DNRC administrative policy.

Recommendation

Options 4, 6, 7, and 9. These options are likely to have the greatest impact on financing water storage projects.

Issue 3 - Cost-sharing and Coordination

When federal funds for water storage development are available, state and local entities are usually required to provide matching funds. However, it is often very difficult for state and local entities to come up with their appropriate share of funds. In view of this situation, the options outlined below are designed to (1) improve the ability to satisfy the cost-sharing requirements; (2) generate funds for operating, maintaining, rehabilitating, and replacing existing storage facilities; and (3) generate funds for constructing projects without federal financial aid.

Options

1. Pursue water storage projects only if they have local and state support and a realistic ability to comply with federal cost-sharing requirements.
2. Creatively utilize all available state, local, and private sources of funding to satisfy federal cost-sharing requirements.
3. **Encourage Resource Conservation and Development areas (RC&Ds) to develop funding packages and create broad-based coalitions to support water storage development.**

4. Make use of existing authorities associated with public entities such as conservancy districts, irrigation districts, and water and sewer districts to tax and collect fees for purposes of funding water storage projects. If existing public authorities are not adequate for the proposed purposes, make the appropriate modification.
5. Establish, on a site-specific basis, special improvement districts, rural improvement districts, conservancy districts, multi-conservation district special project areas, or some combination thereof to help raise funds for water storage projects.
6. Identify potential sources of private sector funding and integrate these on a site-specific basis. These sources might include contributions from various water user groups, such as irrigators, industries, recreationists, conservation and preservation groups, and others.
7. Increase state taxes and designate the additional funds to water storage development.
8. Encourage the state or a coalition of private investors to purchase federally owned water storage projects and operate them to generate funds for operation, maintenance, and new storage projects.

Recommendation

Options 3, 4, and 6. These options are likely to have the greatest impact on financing water storage projects.

Issue 4 - Payment by Beneficiaries

If water storage projects are to be developed or rehabilitated in the future, a diversity of funding sources will be needed. In addition to using federal, state, and private funds, another possibility is to encourage or require all beneficiaries to play a responsible role in financing the projects. The funds generated from this approach could be used to help finance a portion of water storage projects, including planning, construction, operation, maintenance, rehabilitation, and replacement.

The funds raised under any one of the following options would not generally be relied on to repay the entire cost of a project.

Options

1. Continue having irrigation, hydropower, municipal, and industrial beneficiaries repay some

of the project costs through user fees, and allow the sponsor together with the funding source to make site-specific recommendations on whether those fees will adequately cover the costs of the benefits.

2. Conduct a study on the feasibility of having recreational beneficiaries repay a portion of the project costs associated with recreational opportunities. Among the options that might be assessed are:
 - a. A fee, on a site-specific basis, to individuals who take advantage of the recreational benefits associated with water storage projects funded with public resources. Like an entrance fee to a state or national park, the fee would be assessed each time a person participates in some recreational activity related to the water storage project. An annual user's pass would also be available for each site. The funds generated from the fee would be designated for water storage development that includes recreational or fish and wildlife benefits.
 - b. A "water development" stamp. This stamp would be required of anyone purchasing a fishing, duck hunting, boat, or other water-related license. The funds generated from this stamp would be designated for water storage development that includes recreational or fish and wildlife benefits. Such funds would have to be controlled in a manner consistent with state-federal requirements outlined in Section 87-1-701-714, MCA.
 - c. An increase in the Motorboat Fuels Tax to be used for water storage development that includes recreational or fish and wildlife benefits.
 - d. A generic "land and water conservation" license for anyone using public lands or water. At least some of the money generated from these licenses would be designated for water storage development that includes recreational, fish and wildlife, and/or environmental benefits. Such funds would have to be controlled in a manner consistent with state-federal requirements outlined in Section 87-1-701-714, MCA.
 - e. The Department of Fish, Wildlife and Parks providing appropriate funds on an individual project basis through agency funding mechanisms.

3. Continue to use tax revenues to provide a portion of fish, wildlife, recreational, and other environmental benefits associated with water storage projects.
4. Continue to use tax revenues to provide flood control and navigation benefits associated with water storage projects.
5. Continue to use tax revenues to provide a portion of the irrigation, municipal, industrial, and hydropower benefits associated with water storage projects.
6. Charge individuals and groups that benefit from the flood control and navigation benefits of a new water storage project. Create one of the several resource districts possible under Montana law to collect fees and/or require beneficiaries to pay taxes.
7. Require downstream states to financially compensate Montana for the impacts of upstream reservoirs that largely benefit downstream users.

Recommendations

Options 1, 2, 3, 5, and 6. These options are likely to have the greatest impact on financing water storage projects.

Issue 5 - Economic Value of Alternative Uses

The appropriate role of each beneficiary in financing water storage projects might be based on the economic value of the benefits received and the ability of the beneficiary to pay. The problem is that, while it is relatively easy to determine the economic value of hydropower, municipal, and agricultural uses of water, it is much more difficult to estimate the economic value of secondary benefits (e.g., local and state economic development) and other direct benefits (e.g., recreation; fish and wildlife protection; wetlands and riparian habitat preservation; augmentation of flows for water quality, instream flow protection, groundwater recharge, and late season irrigation; and downstream navigation).

Options

1. Conduct research designed to identify all the potential benefits associated with water storage projects, estimate the economic value of all these benefits on a per acre-foot basis, assess the validity of methods used to estimate such values, and generate data that

can be meaningfully compared (e.g., estimate all the values in terms of acre-feet).

2. Conduct research designed to estimate the value of secondary economic benefits related to water storage development, such as rural and local economic development.

Recommendation

No recommendation. While this is an important issue, it is not a high priority. It could be integrated into the study outlined in Issue 4, Option 2.

PLAN IMPLEMENTATION

Legislative Action

The legislature needs to authorize one new staff position for a "water storage development coordinator" in the Department of Natural Resources and Conservation.

The legislature needs to create a "Water Storage Special Revenue Account" and amend Section 85-1-601 et seq., MCA to allocate 25 percent of the Water Development Special Revenue Account to the new account. Section 90-2-101 et seq., MCA, which deals with the Renewable Resource Development Account, needs to be similarly amended. The legislation should specify that the funds in this account will be used exclusively for water storage projects. In addition, the legislation should specify that, if these dedicated funds are not used during a given biennium, they should accumulate rather than being used to support other programs.

The legislature needs to reallocate more non-renewable resource funds (e.g., coal severance tax revenues) to the development of renewable natural resources, particularly water. The legislature also needs to adopt a provision in Section 85-1-604 and Section 15-38-202, MCA to authorize the use of 25 percent of the funds over and above the statutory minimum balance of \$100 million on the revenue from the Resource Indemnity Trust for water storage projects.

Administrative Action

The Department of Natural Resources and Conservation needs to hire (or, in the event that the legislature does not authorize a new position, the DNRC would need to reallocate an existing position for) a water storage development

coordinator to document existing federal, state, local, private, and other sources of funding for water storage projects; facilitate efforts to develop water storage projects; identify potential sources of funding in the private sector and include these in funding packages for specific projects; help develop a biennial report on water storage activities, as outlined in Subsection 1; and perform other duties as assigned.

The Department of Fish, Wildlife and Parks, in cooperation with the Department of Natural Resources and Conservation, needs to study the feasibility for having recreational beneficiaries repay some of the project costs associated with recreational benefits.

Resource Conservation and Development Areas and existing districts need to develop funding packages and

support water storage development. They also need to develop mechanisms to charge flood control and navigation beneficiaries.

Water storage development sponsors should continue to use tax revenues for a portion of irrigation, hydropower, municipal, industrial, fish, wildlife, recreational, and other environmental benefits related to water storage projects.

Financial Requirements and Funding Strategies

Sufficient funds will need to be authorized both legislatively and administratively to hire a water storage development coordinator and for the coordinator to carry out his or her responsibilities. Adequate funds will need to be authorized to conduct a study on the feasibility of recreational user fees.

Plan Implementation Summary

<u>Activity</u>	<u>Responsibility</u>	<u>Deadline</u>
Issue 1 - Information and Education		
Hire a water storage development coordinator	Legislature and DNRC	June, 1991
Document programs	Water storage development coordinator	January, 1992
Issue 2 - Water Development Programs		
Create a water storage special revenue account	Legislature	April, 1991
Reallocate more non-renewable resource funds to renewable resource development	Legislature	April, 1991
Authorize RIT funds for water storage	Legislature	April, 1991
Issue 3 - Cost-sharing and Coordination		
Develop funding packages and coalitions	RC&Ds and existing districts	Ongoing
Integrate private sources of funding	Water storage development coordinator	Ongoing
Study and make use of existing authorities to tax and collect fees for water storage projects	Water storage development coordinator	Ongoing
Issue 4 - Payment by Beneficiaries		
Assess the appropriateness of fees paid by irrigation, hydropower, municipal, and industrial beneficiaries	Water storage development coordinator	Ongoing
Conduct a study	DFWP and DNRC	June, 1992
Charge flood control and navigation beneficiaries	RC&Ds and Water Storage Districts	Ongoing
Use general tax revenues for a portion of irrigation, hydropower, municipal, and industrial, fish, wildlife, recreational, and other environmental benefits	Water storage development sponsors	Ongoing

SUBSECTION 3: WATER STORAGE REGULATIONS

BACKGROUND

The planning, construction, operation, maintenance, and rehabilitation of water storage facilities in Montana is regulated by a multitude of federal, state, and local laws and administrative rules as well as international, interstate, and tribal treaties and compacts. In those laws, rules, and agreements, various requirements are designed to protect public interests in water appropriation and use, health and safety, environmental conservation, and cultural site preservation.

Examples of regulations that protect the interests of Montana's citizens include the Montana Water Use Act, which provides for the granting of water rights for a wide diversity of beneficial water uses including water stored for irrigation, hydropower, and recreation. Other laws regulate water storage by requiring minimum streamflows to maintain water quality and by governing construction of storage facilities to protect public health and safety. Examples include the Federal Safe Drinking Water Act, the Federal Power Act, the Montana Dam Safety Act, and local flood plain ordinances. Laws such as the Federal Endangered Species Act, Wild and Scenic Rivers Act, and National Historic Preservation Act guard environmental and cultural values by prohibiting storage or requiring mitigation where storage may impact natural resources, important wildlife species, or historical sites.

The state also has obligations under international, interstate, and tribal treaties and compacts that may limit the availability of water for storage. For example, the 1909 Boundary Waters Treaty between the United States and Canada provides for the division of flows in the Milk and St. Mary rivers. The Yellowstone Compact is an interstate agreement allocating basin water between Montana, Wyoming, and North Dakota. Indian tribes have rights to use water under state and federal laws.

The laws, regulations, and agreements applicable to water storage are summarized in the water storage regulations background document which is available from the DNRC upon request. A preliminary review indicated that some requirements may unduly hinder water storage development in Montana. The identified issues are addressed in this water plan section.

POLICY STATEMENT

Water storage is one of several tools available for managing Montana's water resources. A substantial number of laws and regulations affect water storage activities

and are necessary to protect vital public interests and environmental values. The state of Montana should act to ensure that laws and regulations are reasonable and properly administered to allow for the use of storage as a viable water management tool.

ISSUES, OPTIONS, AND RECOMMENDATIONS

Issue 1 - Duplicative Laws and Regulations

Some laws and regulations contain duplicative requirements, result in overlapping administrative authorities, and set forth conflicting definitions. For example, high-hazard dams in Montana located on certain national forest land are governed by similar requirements under the Montana Dam Safety Act, Federal Land Policy and Management Act, and federal Wilderness Act. In addition, definitions of such terms as "navigable" and "stream bed" differ between laws and may be inconsistent. As a result, water storage development and operation may be unnecessarily cumbersome and confusing.

Options

1. **Identify unnecessary duplications and inconsistencies and recommend corrective measures.** This evaluation could address one or more of the following issues.
 - a. **Identify duplicative requirements, overlapping administrative jurisdictions, and inconsistent definitions of common terms.**
 - b. **Identify federal laws whose administration could be assumed by the state to improve efficiency and enhance sensitivity to local problems and concerns.**
 - c. **Identify overlapping state regulatory authority.**
2. **Designate a lead agency to coordinate all water storage permitting.**
3. **Take no action.** The existing requirements, authorities, and definitions are appropriate to manage the resource.

Recommendation

Option 1. The evaluation and corrective measures will streamline regulation of water storage development.

Issue 2 - Costs Related to Dam Safety

Structural repairs or construction of existing and proposed high-hazard dams may be prohibitively expensive. One factor affecting costs are dam safety regulations. The Montana Dam Safety Act establishes the degree of risk to life and property that is acceptable with respect to a high-hazard dam, defined as any dam or reservoir that, if it fails, would likely cause a loss of life. Classification as a high-hazard dam does not imply nor determine whether or not the dam is structurally sound. If risks to public safety are increased—for instance, accepting more than one lost life or allowing a lower minimum spillway capacity—the costs of rehabilitating existing dams and building new facilities would decrease. Conversely, increased safety raises costs. In general, the administrative rules implementing the Montana Dam Safety Act require high-hazard dams to satisfy federal standards. However, standards in the Montana Dam Safety Act for designing spillways are less stringent than federal standards.

The administrative rules implementing the Montana Dam Safety Act require that, by July 1, 1995, existing high-hazard dams, as identified by the Corps of Engineers in 1981, must obtain an operating permit from the Department of Natural Resources and Conservation verifying that the dams satisfy safety standards. To date, studies have been completed on only approximately 33 of 85 high-hazard reservoirs to determine the modifications needed to satisfy the standards. Costs of rehabilitating state-owned high-hazard dams is expected to exceed \$200 million. The costs of engineering studies and rehabilitation construction may be prohibitively expensive, thereby causing a delay or an inability to meet dam safety standards.

Options

1. Revise the Montana Dam Safety Act to increase the acceptable degree of risk to public safety and to reallocate responsibility for that risk between the public, government, and dam owners.
2. Repeal the Montana Dam Safety Act and defer all dam safety activities to the federal government.
3. Evaluate the Montana Dam Safety Act and implementing regulations to:
 - a. Determine the acceptable degree of risk to public safety and appropriate allocation of responsibility for that risk between the public, government, and dam owners.
 - b. Determine whether the definition of a high-hazard dam should be modified.

- c. Determine whether the high-hazard classification should be expanded into a risk scale that allows structural design requirements to reflect probable risk to life and property.
 - d. Determine whether the Department of Natural Resources and Conservation should be given greater discretion to substitute alternative means of addressing risks, such as early warning systems, for structural design requirements.
4. Take no action. The current provisions of the Montana Dam Safety Act appropriately address dam safety concerns.

Recommendation

Option 3. Dam safety is an important public policy issue, and acceptable risks to public safety must be determined. In recommending Option 3, the State Water Plan Advisory Council acknowledges that the DNRC should assess alternative means of addressing risks, such as requiring early warning systems and balancing risks with consequential costs, and initiate rulemaking as appropriate.

Issue 3 - Inability of Private Entities to Obtain Water Reservations

Under the Montana Water Use Act, only public entities may apply to reserve water for existing and future beneficial uses, including those involving the storage of water. Private entities are prohibited from directly obtaining water reservations. Another way to secure water for future uses is to extend the time limit for developing water rights. Excluding private entities from acquiring water reservations may preclude some private development of water storage having public benefits. In addition, while the Montana Water Use Act allows water reservations for multi-purpose uses, there may be perceptions that water reservations are for single-purpose uses only.

Options

1. Revise the Montana Water Use Act to allow private entities to obtain water reservations.
2. Revise the Montana Water Use Act to extend the 10-year limit on developing water use permits associated with water storage development.
3. Provide public education to encourage water reservations for multipurpose uses.

4. Designate or create a public body to advance water reservation applications for private entities.
5. **Evaluate the Montana Water Use Act and the desirability of:**
 - a. Allowing private entities to obtain water reservations.
 - b. Designating or creating a public body to advance water reservation applications for private entities.
6. Take no action. The Montana Water Use Act appropriately guides beneficial water uses.

Recommendation

Options 2, 3, and 5. By extending the time limit for developing water rights associated with water storage, private development of storage projects will be facilitated. The policy restricting water reservations to public entities should be re-evaluated to determine whether the public use preference should stand.

Issue 4 - Lack of Information about Water Storage Laws

No comprehensive source of information exists on the laws and regulations affecting the development and operation of water storage projects. Consequently, potential project developers may be unaware of the legal requirements that must be met as well as the resources available for assistance. Development of water storage projects may be facilitated by easy access to this information.

Options

1. Prepare, distribute, and regularly update (1) a directory of laws and regulations applicable to water storage, and (2) a booklet describing the major requirements and identifying administrative agencies; both suitable for use by laypersons.
2. Develop and administer a targeted program of education to promote awareness of legal requirements and sources of information applicable to the development and operation of water storage projects.
3. Designate a person to serve as an information coordinator for permitting and regulatory issues related to water storage development.

Recommendation

All options. These activities would make information accessible and assist in the proper development of water storage facilities.

Issue 5 - Repairing Wilderness Area Dams

Rules and regulations pursuant to the Wilderness Act may constrain the maintenance or rehabilitation of dams in wilderness areas. The use of mechanized equipment in designated wilderness areas for maintenance or rehabilitation is prohibited, except where such use was practiced prior to wilderness designation or is authorized by the Chief of the Forest Service under specifically approved guidelines. There are 16 dams in Montana's wilderness areas that potentially threaten public safety, and others may exist in future wilderness designations.

Potential problems related to dams located in wilderness areas include (1) regulations governing wilderness areas may hinder dam maintenance, (2) rule implementation may impede dam maintenance, (3) dam owners may not understand the regulations affecting the use of mechanized equipment to maintain dams, and (4) dam owners, for any number of reasons, may not be willing or able to comply with wilderness area regulations. Any one or combination of these problems has, in some cases, led to dams deteriorating to the point where they may threaten public safety.

Options

1. Develop an informational program describing the application procedure for the use of mechanized equipment and other rules applicable to dam repair in wilderness areas.
2. Develop a training program for state and federal administrators to promote better implementation of regulations governing wilderness areas.
3. Develop more detailed guidance in the wilderness regulations promoting public safety through dam maintenance procedures.
4. Develop a public process, which may include the U.S. Forest Service, Bureau of Land Management, Department of Natural Resources and Conservation, dam owners, conservationists, consultant firms, and other interested persons, to identify problems and develop appropriate solutions.

Recommendation

Option 4. Since the nature and scope of the problem is unclear, further examination by affected parties is necessary.

PLAN IMPLEMENTATION

Legislative Action

The Water Policy Committee needs to reevaluate the acceptable degree of risk to public safety under the Montana Dam Safety Act. The Water Policy Committee also needs to consider the public policy of extending water reservations to private entities under the Montana Water Use Act.

The legislature needs to revise the Montana Water Use Act to extend the 10-year limit on developing water use permits associated with water storage development.

Administrative Action

The Department of Natural Resources and Conservation needs to evaluate federal, state, and local laws and regulations applicable to water storage to identify duplicative requirements, overlapping administrative authorities, and conflicting definitions and make reports and recommendations to the State Water Plan Advisory Council, Board of Natural Resources and Conservation, Legislative Water Policy Committee, and legislature as appropriate.

The Department of Natural Resources and Conservation needs to draft administrative rule changes to implement decisions of the Legislative Water Policy Committee.

The Department of Natural Resources and Conservation and the Montana Water Resources Center need to

develop and administer a targeted education program to: (1) encourage water reservations for multipurpose uses, and (2) promote awareness of legal requirements and sources of information applicable to the development and operation of water storage projects.

The Department of Natural Resources and Conservation needs to prepare, distribute, and regularly update (1) a listing of laws and regulations applicable to water storage, and (2) a booklet that describes the major requirements and identifies administrative agencies; both suitable for use by laypersons.

The Department of Natural Resources and Conservation needs to designate an individual to serve as an information coordinator for permitting and regulatory issues related to water storage development.

The Department of Natural Resources and Conservation needs to develop, in cooperation with appropriate federal and state agencies, a public process to identify problems associated with the maintenance of dams in wilderness areas and develop appropriate solutions.

Financial Requirements and Funding Strategies

The legislature needs to provide adequate funding for the Water Policy Committee to conduct a water storage regulation study. Approximately \$5,000 is needed during the 1991-92 biennium for the Department of Natural Resources and Conservation to print and distribute the water storage regulation directory and booklet.

Plan Implementation Summary

<u>Activity</u>	<u>Responsibility</u>	<u>Deadline</u>
Issue 1 - Duplicative Laws and Regulations Water Storage Regulation Study	DNRC	November, 1992
Issue 2 - Costs Related to Dam Safety Water Storage Regulation Study	Legislative Water Policy Committee DNRC	November, 1992
Issue 3 - Inability of Private Entities to Obtain Water Reservations Water Storage Regulation Study Public Education	Legislative Water Policy Committee DNRC and Montana Water Resources Center	November, 1992 January, 1992/ Ongoing
Issue 4 - Lack of Information about Water Storage Laws Designate a water storage coordinator Prepare and distribute water storage regulation directory and booklet Public education	DNRC Water storage coordinator Water storage coordinator	June, 1991 January, 1992 January, 1992/ Ongoing
Issue 5 - Inability to Repair Wilderness Area Dams Sponsor a public forum	Governor's Office DNRC U.S. Forest Service	December, 1990

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WATER RESOURCES DIVISION • DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

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INTRODUCTION

Montana's water supplies vary from year to year. Some years there is too much water and flooding occurs. In other years, there is too little water and drought results. Drought is an inevitable part of Montana's climate. It will happen again as it has happened in the past.

Most Montanans understand that drought is inevitable. This does not mean that they can do nothing to reduce drought effects. Although the state may not be able to make it rain or snow, it can help its citizens prepare for and minimize the effects of drought.

The questions are whether, how, and when the state should use its authority to ease the effects of drought. This section of the state water plan proposes an answer to these questions. A policy is proposed that defines the proper role of the state in drought management. Then, this plan section recommends specific actions to fulfill that role.

BACKGROUND

Drought threatens all water needs. Dryland agriculture is particularly vulnerable. Drought also increases the threat of wildfire. These drought-related impacts arise primarily from soil moisture deficiencies. However, the most controversial drought issues typically surround the use of water from our streams, lakes, and aquifers.

The prior appropriation doctrine determines who gets to use scarce water from these sources. This doctrine of "first in time is first in right," which will continue to be the basis for water allocation and use in the state, assigns priority to water uses based solely on the date of appropriations. Given the unadjudicated status of most water rights in Montana, drought presents several problems for Montana water users. These problems include: (1) procedural difficulties in enforcing unadjudicated water rights; (2) the expense of beginning to enforce water rights in areas that historically lacked enforcement; (3) a lack of water conservation incentives in the law; and (4) legal restrictions and practical difficulties associated with changes in the use of water rights.

Under these circumstances, how can important water uses be protected? In extreme, life-threatening emergencies, the government has the authority to take water rights, with pay, to protect the public good. Such a situation is better avoided. Less intrusive ways to cope with the effects of drought, or possibly to prevent them, are preferred.

Another approach is to better inform water users about the probability of drought. Where drought appears likely,

water users may be asked to consider options that would minimize their risk and extend limited water supplies. This approach requires planning. Planning may also reduce the vulnerability of agriculture and forests to drought. Because drought occurs with greater warning and frequency than other kinds of disasters, planning has great promise for reducing its effects.

Much was learned in recent years about the types of impacts and conflicts that are likely during drought. Perhaps the most important lesson is that the best time to reduce the impacts of drought is before they happen. Recent experience has shown the need for a larger box of tools to prevent and mitigate drought-related problems.

POLICY STATEMENT

It is the policy of the State of Montana to support proactive drought management at the local level to protect the natural resources, economic base, and lifestyles of Montana citizens. This policy requires programs for drought monitoring, assessment, preparedness, mitigation, and assistance.

The state must consider the needs of all water users during drought, including dryland and irrigated agriculture; municipal and rural water suppliers; energy producers; mining and mineral processing, forest products, tourism, recreationists, and recreation-based businesses; and individual water users. Incentives should be provided for all water users to act to prevent or reduce the effects of drought. State technical and financial assistance should be provided to water users in a consistent and predictable manner. Water users should consider the risks posed by drought when making major management decisions and should know what to expect from government if drought occurs.

ISSUES, OPTIONS, AND RECOMMENDATIONS

Eight functions are identified as necessary for accomplishing the state's proactive drought management policy. The issues are how to accomplish these eight functions.

Issue 1 - Drought Monitoring and Early Warning

Drought monitoring means collecting data, analyzing it, and reporting on the probability and severity of drought. Several government agencies and a few private entities are involved. Current monitoring efforts can be improved to provide better early warning of drought conditions.

One useful tool for monitoring drought is the Palmer Drought Index (PDI). The PDI is valuable as a measure of soil moisture and its availability to meet the needs of dryland crops and rangeland forage. The PDI is calculated weekly by the National Weather Service for seven broad regions of Montana. These regions are so large that some locally severe drought conditions go unreported. Also, the PDI is not a good predictor of streamflows, particularly in mountainous regions where runoff depends primarily on snowmelt. An alternative index, known as the Surface Water Supply Index (SWSI), is being developed to forecast streamflow conditions in such areas. In Montana, both the PDI and SWSI may be used for drought early warning and monitoring. The SWSI is applicable to water users dependent on streamflows, and the PDI is applicable to dryland agriculture.

Questions arise as to how monitoring information should be compiled and made accessible. Who should be responsible? Should monitoring efforts be intensified as drought conditions appear likely?

Options

1. Improve monitoring of soil moisture.
2. Pursue the calculation of the PDI for smaller geographical areas.
3. Encourage the continued development and revision of basin-specific SWSIs.
4. Improve coordination in the collection, interpretation, and reporting of the PDI, SWSI, and other drought forecasting and monitoring information. This information must be passed on to people in time for them to make decisions to reduce their vulnerability to drought.

Recommendations

Options 2, 3, and 4 are recommended. Option 1 was considered desirable, but rejected on the basis of potential manpower and cost-related problems.

Issue 2 - Impact Assessment

Drought impacts are assessed by using the monitoring information to predict economic, environmental, and social costs. Assessments may be prepared on the drought-related impacts to: (1) specific crops and livestock, (2) tourism, (3) energy production, (4) domestic water supplies, (5) wildfire, and (6) fish and wildlife.

Options

1. Support research applicable to specific Montana locations on the relevance of water availability to

crop and livestock production, tourism, energy production, the quality of domestic water supplies, wildfire potential, and fish and wildlife production.

2. Develop economic models that can compare the value of water for various uses in the economics of specific areas in Montana.
3. Coordinate the efficient and timely assessment of impacts related to various water uses. A list of the individuals with the expertise to assess impacts should be maintained.

Recommendation

Option 3 is recommended. While basic research is strongly supported, Option 1 was rejected as being too vague to be implemented. The economic information derived under Option 2 would also be useful, but this option was rejected to avoid creating the false impression that the state is interested in reallocating water based on economic values.

Issue 3 - Coordination of Governmental Actions

Coordination is essential to properly administer programs for drought monitoring, impact assessment, assistance, education, and mitigation. Presently, the vehicle for drought management coordination is the 1985 Montana Drought Plan. This plan designates the Disaster Advisory Council as responsible for providing coordination. However, the plan and the Disaster Advisory Council are only activated after a drought situation emerges. This is contrary to the proposed proactive drought policy. Further, the coordination provided by the plan is vague with respect to drought monitoring, management decision making, assistance, education, and mitigation. There is little knowledge of, or adherence to, the plan by most other drought-affected government agencies or the general public.

Options

1. Replace the current drought plan, by directive of the governor, with a document that incorporates the recommendations of the state water plan.
2. Expand the Disaster Advisory Council to include federal, local government, and private representation.
3. Create a permanent Drought Monitoring Committee responsible for forecasting drought conditions. This committee would advise the governor of the need to activate the Disaster Advisory Council. The Drought Monitoring Committee would have authority to:
 - a. review and report drought monitoring information.

- b. identify those areas of the state with a high probability of drought and target reporting and assistance efforts to those areas.
 - c. upon request, appoint and organize local drought advisory committees for those areas. Committee membership should be comprised of state and local government officials, including conservation districts; and local water user groups, including dryland and irrigated agriculture, municipal and rural water suppliers, energy producers, mining and mineral processing, forest products, tourism, recreationists and recreation-based businesses, and individual water users, agriculture, recreation and tourism businesses, and other economic interests important in that area.
 - d. assign state agency staff to provide technical assistance to local drought advisory committees.
4. Provide specific criteria for activation of the Disaster Advisory Council, other than a governor's directive.
 5. Reassign responsibility for state drought management coordination from the Disaster Advisory Council to a permanent Drought Advisory Council. The Drought Advisory Council would be chaired by a representative of the Governor's Office and representatives of each of the other agencies previously represented on the Disaster Advisory Council, though not necessarily the directors of those agencies. Non-voting representatives of federal and local governments and public and private interest groups should also be appointed. The Drought Advisory Council would have authority to:
 - a. review and report drought monitoring information.
 - b. identify those areas of the state with a high probability of drought and target reporting and assistance efforts to those areas.
 - c. upon request, appoint and organize local drought advisory committees for those areas. Committee membership should be comprised of state and local government officials, including conservation districts; local water user groups, including dryland and irrigated agriculture, municipal and rural water suppliers, energy producers, mining and mineral processing, forest products, tourism, recreationists and recreation-based businesses, and individual water users, agriculture, recreation and tourism businesses, and other economic interests important in that area.

- d. request state agency staff to provide technical assistance to local drought advisory committees.

Recommendations

Options 1 and 5 are recommended.

Issue 4 - Triggering Mechanisms

The current drought plan uses the Palmer Drought Index to trigger certain drought response activities. With the development of the Surface Water Supply Index, an additional criterion becomes available that is more applicable to surface water users. These criteria may be used to gauge the propriety of certain drought management activities against the severity of the drought conditions.

Triggering mechanisms serve as guides for state action. They are not intended to replace existing procedures based on local conditions and requests. For example, the issue of when to declare a disaster, and when to declare the disaster over, can be controversial. Some recreation-based businesses may oppose the designation, while some farmers and ranchers may want it in order to take advantage of federal assistance programs. This kind of conflict is best dealt with at the local level, with the triggering mechanisms merely serving as guidelines to help in making such decisions.

Options

1. To insure that drought-response efforts correspond to the magnitude of specific drought conditions, the drought plan should recommend specific actions corresponding to numerical indicators of drought severity. Actions should be linked to numerical thresholds as drought conditions both intensify and recede.
2. Both the PDI and the SWSI should be used as triggering mechanisms. The PDI should be used to indicate drought severity to dryland agriculture, and the SWSI to forecast and measure the severity of drought for surface water users. Other drought monitoring information should also be considered. If this information indicates that the PDI or the SWSI are not accurate indicators of drought severity, actions should be taken earlier or later than the triggering mechanisms would suggest.

Recommendations

Both options are recommended.

Issue 5 - Assistance Programs

Assistance programs are programs available immediately prior to, during, and after a drought. Some of these programs are reactive, rather than preventive, in nature. Federal assistance programs are primarily geared to providing financial assistance, while state assistance programs generally provide technical assistance. The federal government administers the crop insurance program, which allows farmers to protect themselves financially against drought losses. Other federal programs are activated when a disaster is declared by the president or the chief executive officer of the responsible federal agency. Although the majority of these programs are geared to agricultural users, there are a limited number of programs for other types of assistance needs.

Options

1. Expand the types of technical and financial assistance provided to all victims of drought, filling the gaps left by federal financial assistance programs.
2. Update the list of available state and federal assistance programs in the state drought plan.
3. Provide technical and financial assistance to local drought advisory committees for promoting local drought preparedness.
4. Oppose elimination of the federal crop insurance program, and support changes in this program that will make it more efficient and attractive to producers.

Recommendations

Options 2, 3, and 4 are recommended. Option 1 was rejected as being too vague and politically impractical.

Issue 6 - Funding for Drought Management Programs

Drought monitoring, assessment, education, mitigation, and assistance all cost money. The issue is how to pay for improved state drought management. Some improvement in drought management programs may be possible by reallocating and better utilizing existing resources. Significant improvements are unlikely without additional funds.

Options

1. Reallocate and better utilize existing staff and operating budgets.
2. Apply for grant funding from the Montana Water Development Program, Renewable Resource Development Program, or other state or federal sources for a pilot drought management program.

3. Seek a direct legislative appropriation of funds.

Recommendations

Option 2 is recommended. Option 1 is recommended as a fallback position if grant funding does not materialize. Option 3 was rejected as unrealistic in light of the state's current budget problems.

Issue 7 - Research and Educational Programs

Many educational opportunities are available on how to prepare for drought through the Cooperative Extension Service, the Soil Conservation Service, the Bureau of Reclamation, local conservation districts, and other agencies. Some people may not know this information exists. A water education program was just recently established at the Water Resources Research Center in Bozeman. This program will provide information to adults and also develop a training program and curriculum for school teachers to teach Montana's children about water resources and its management.

Research is ongoing in a number of areas to find ways to reduce drought impacts, particularly those suffered by agriculture. One example is research to develop more drought resistant varieties of crops.

Options

1. Encourage the use of existing water educational programs, including those of the Extension Service, Soil Conservation Service, conservation districts, and the water education program being developed at the Water Resources Research Center.
2. Support ongoing research into ways to improve drought monitoring, assessment, and mitigation.
3. Publish and distribute a comprehensive annotated directory of available educational resources about water conservation.
4. Better utilize the media and other means of communication for informing the public about drought management options and activities.

Recommendations

All of the options are recommended.

Issue 8 - Drought Mitigation Strategies

Drought mitigation strategies are potential options or improvements to ongoing water management activities that would, over the long term, reduce the adverse effects of drought.

Options

1. Amend the law to allow emergency water right transfers with expedited state review.
2. Allow utilities to invoke temporary water rate hikes to encourage emergency water conservation measures.
3. Use weather modification technology where it is feasible.
4. Increase the emphasis given to the watershed-related aspects of forest and range management, managing plant and tree ground-cover to retain soil moisture rather than increasing runoff.
5. Provide county governments, conservation districts, or water conservancy districts the emergency authority to implement and enforce local drought plans.
6. Inventory and review operating plans of all existing reservoirs in water-short basins to encourage reservoir operators to adequately consider drought contingencies.
7. Inventory and review the operating plans of state-funded reservoirs to insure that these plans address drought contingencies. Where no operating plans exist for these reservoirs, such plans should be developed and implemented. Also, these reservoirs should be rehabilitated to operate at design capacity and improve the state's capabilities to respond to drought consistent with State Water Plan recommendations for the rehabilitation of water storage projects.
8. Establish stronger economic and other incentives for private investments in water conservation.
9. Consider feasible water storage where it will increase water supply security.
10. Consider basin closure by petition of local water users, as provided by law, to preclude over-appropriation and further aggravation of water shortage situations.
11. Encourage voluntary water conservation by domestic, municipal, and industrial water users.
12. Clarify state law so that water right holders who conserve water are clearly allowed to sell or lease the salvaged water in a manner that does not adversely affect existing water users.
13. Improve water use and conveyance efficiencies in agricultural, municipal, and industrial systems where such improvements will not adversely affect groundwater supplies or return flows needed by other water users.
14. Clarify state law to clearly allow the voluntary, temporary changes of private water rights and

contract water exchanges. Such changes could reallocate water to highly valued offstream and instream water uses, whose users anticipate water short years. Such reallocations would be regulated by the state to insure the protection of other potentially affected water users and would have to be planned well in advance of the anticipated dry years.

15. Urge the Board of Natural Resources and Conservation to adopt rules where the installation of water measuring devices will significantly help to resolve conflict and improve the distribution of water during drought in water-short drainages.
16. Find ways to expedite the resolution of local water use conflicts and water rights enforcement during drought before the general adjudication process is completed.
17. Develop a model water conservation ordinance or contract clause for adoption by municipalities and rural domestic water suppliers.
18. Adopt a section of the State Water Plan devoted to the appointment and operation of permanent basin advisory committees. These committees should serve as forums for discussing any local water-related problems and management issues, including drought.

Recommendations

Options 6 through 18 are recommended. Option 1 was rejected because the committee felt there was no way to expedite the water right change process without compromising the protection of other water right holders. Options 2 and 5 were rejected because these authorities already exist. Options 3 and 4 were not believed to be viable drought management tools at this time.

PLAN IMPLEMENTATION

Legislative Action

First, the legislature needs to transfer the disaster planning responsibility for drought from the Department of Military Affairs to a Drought Advisory Council. Second, the legislature needs to clarify that the water rights change statute allows voluntary, temporary water right changes that would not adversely affect other water users. Third, the legislature needs to clarify that water right holders who salvage water through conservation retain the right to sell or lease that water.

Administrative Action

Calculating the Palmer Drought Index for smaller geographical areas should be the responsibility of the State Climate Center at Montana State University. The Soil Conservation Service should continue to develop and refine the Surface Water Supply Index. Coordination in reporting drought monitoring information should be the responsibility of the Department of Natural Resources and Conservation (DNRC), in cooperation with the Montana Water Information System in the State Library. The DNRC would report drought information using computer generated maps prepared by the Montana Water Information System. The reporting effort should make better use of the media and other available means of communication, such as computer bulletin boards.

Once authorized by the governor and the legislature, the Drought Advisory Council should oversee the development of a new Montana Drought Plan. The new Montana Drought Plan should list individuals with the technical expertise and responsibility to perform drought impact assessments, upon request of the Drought Advisory Council. This plan should also provide an updated list of state and federal assistance programs and identify the specific triggering mechanisms used to guide drought management actions.

Once a high probability of drought is indicated, the Drought Advisory Council should consult with the local officials in the drought prone area and offer to provide state assistance to a local drought advisory committee. Local drought advisory committees also may be created in normal years where sufficient interest exists. Figure 1 depicts

the relationship between the State Drought Advisory Council and local drought advisory committees. The DNRC would staff the State Drought Advisory Council and provide technical assistance to local drought advisory committees. The state council is not intended to have any authority over the local committees. This relationship is necessary merely to ensure coordination between the state and local levels. Existing organizational relationships between state government and local officials (such as the relationship between the DNRC and local conservation districts) should be used to the extent possible to ensure efficient coordination. Local entities, such as conservation districts, should be encouraged to apply for state financial and technical assistance to develop local drought plans at any time.

The publication of an annotated directory of available educational resources about water conservation should be the responsibility of the new water education program at the Water Resources Research Center in Bozeman. This program should also promote voluntary water conservation as part of its general educational charge and encourage the use of water education resources in the state.

The Board of Natural Resources and Conservation is urged to adopt rules relating to water measuring devices, as necessary to resolve conflict and improve distribution of water during drought. Similarly, the State Water Plan Advisory Council should actively solicit the development of a state water plan section on basinwide, or local level, water resources planning. The way in which water storage will be considered for improving water supply security should be determined in the state water plan. The cooperation and assistance of the state Water Court and local district courts should be sought to find ways to expedite the resolution of local water right conflicts during drought.

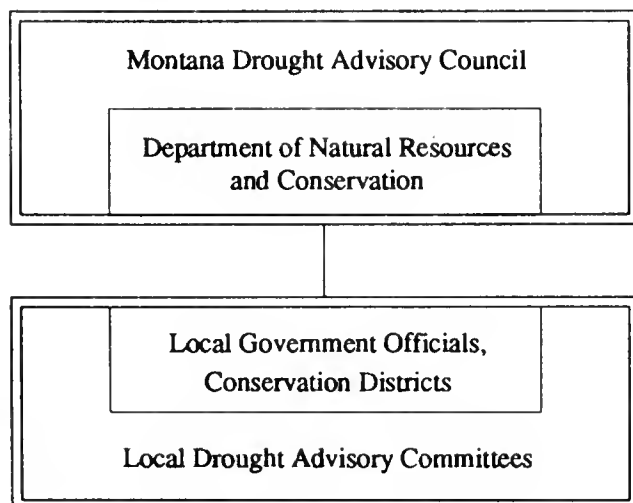
The responsibility falls to the Drought Advisory Council, with DNRC staff, to implement all of the other recommendations in this plan section, although other entities will certainly play an important part. These recommendations include suggesting basin closure as an option for local water users, seeking more efficient water use and conveyance by large water users, inventorying and reviewing reservoir operating plans, opposing elimination of the Federal Crop Insurance Program, and developing a model water conservation ordinance for adoption by municipalities and rural domestic water suppliers.

Financial Requirements and Funding Strategies

A grant is requested from the Water Development Program to establish a pilot drought management program.

Figure 1.

Organization for Proactive Drought Management



This grant will be a cooperative endeavor involving the State Climate Office, the State Library, the Water Center at Montana State University, and the DNRC. The grant would provide staff and an operational budget to initiate implementation of the recommendations of this plan section.

A priority use of the grant would be to test the proactive, locally-focused drought management approach if a drought arises during the time when grant resources are available. If no drought develops, the funds will be used to lay the foundation for the use of this management approach when the occasion arises. This foundation includes the production of the new Montana Drought Plan, the establishment of the improved monitoring and early warning system, and the development of educational efforts and various mitigation strategies.

The reallocation of DNRC staff resources and operating expenses is recommended as a fallback method of funding some of the recommendations in this plan section if grant funds are not awarded. The efficient use of existing financial resources, and any available grant funding, is essential to implement this plan section.

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Plan Implementation Summary

<u>Action</u>	<u>Responsibility</u>	<u>Deadline</u>
Issue 1-Drought Monitoring		
Calculate PDI for smaller regions	State Climate Center	January, 1992
Develop SWSI	Soil Conservation Service (SCS)	January, 1992
Improve monitoring coordination	DNRC, State Library	January, 1992
Issue 2-Impact Assessment		
Coordinate timely impact assessments	Drought Advisory Council	As Needed
Issue 3-Coordination of Government Actions		
Replace State Drought Plan	Governor, Drought Advisory Council	August, 1991
Reassign drought management responsibility to Drought Advisory Council	Legislature	April, 1991
Issue 4-Triggering Mechanisms		
Include triggering mechanisms in new drought plan	Drought Advisory Council	August, 1991
Issue 5-Assistance Programs		
Update list of assistance programs	Drought Advisory Council	August, 1991
Assist local drought advisory committees	All State and Federal Agencies	As Needed
Issue 6-Funding Drought Management Programs		
Obtain grant funding	Legislature	July, 1991
Issue 7-Research and Education Programs		
Encourage the use of existing programs	MSU Water Center, SCS, Extension Service, Conservation Districts, DNRC	Ongoing
Support ongoing research	Montana University System	Ongoing
Publish directory of water conservation information	MSU Water Center	January, 1992
Develop public information strategy	Drought Advisory Council	August, 1991
Issue 8-Drought Mitigation Strategies		
Inventory reservoir operating plans	Drought Advisory Council, DNRC	July, 1992
Consider water storage and basin closure	Drought Advisory Council, DNRC	Ongoing
Encourage water conservation	Drought Advisory Council, DNRC	Ongoing
Clarify that state law allows sale or lease of salvaged water	Legislature	April, 1991
Clarify that state law allows voluntary, temporary water right transfers	Legislature	April, 1991
Consider adoption of water measurement rules	Board of Natural Resources and Conservation	October, 1992
Expedite water rights conflict resolution and enforcement	Water and district courts, Drought Advisory Council, DNRC	Ongoing
Develop a model water conservation ordinance	Drought Advisory Council, DNRC	August, 1991
Adopt a state water plan section on basin planning	DNRC	December, 1990

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MONTANA WATER PLAN

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WATER RESOURCES DIVISION • DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

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INTRODUCTION

In this plan section, the term "water storage projects" includes the construction of new storage projects and the rehabilitation and expansion of existing facilities. The term also encompasses all three types of storage. Onstream storage refers to facilities that are located on a stream or river and impound only the natural flow of that stream or river. Onstream storage may be located on either mainstem rivers or tributary streams. Offstream storage refers to facilities where the primary water supply is diverted from another water course or storage facility. Finally, nonstructural storage refers to any nonstructural or management activity that affects the timing and flow of water in a natural water course (e.g., groundwater recharge, wetlands enhancement, and watershed management).

Historically, water storage projects have provided a variety of benefits to the state of Montana. Reservoirs store water for irrigation, municipal, industrial, and stockwater consumption; provide opportunities for flatwater fishing and boating and improve riparian habitat; supply water for hydropower generation; and regulate streamflows for irrigation, flood control, hydropower, water quality, and fishery purposes. In many cases, storage projects have improved fisheries and recreational opportunities.

The first storage projects in Montana were built to supply water for mining operations. The homesteaders who followed relied upon small irrigation projects for agricultural development in Montana's semi-arid climate. As the state's population grew, so did the size, number, and variety of reasons for constructing water storage projects. By the 1980s, the Soil Conservation Service, the Bureau of Reclamation, the U.S. Army Corps of Engineers, and the Agriculture Stabilization and Conservation Service had combined with state and private entities to develop an estimated 11,000 reservoirs in Montana. Of these, 67 reservoirs store over 5,000 acre-feet of water, while two-thirds of the reservoirs are primarily for stockwater and hold less than 50 acre-feet.

The largest water storage projects (Fort Peck, Canyon Ferry, Hungry Horse, Yellowtail, Libby, and Tiber dams) were built by the federal government. These storage facilities are used for multiple purposes, including irrigation, flood control, hydropower production, and by recreationists who take advantage of the opportunity to swim, boat, fish, and water ski. The state owns several storage projects that were constructed in the 1930s and 1940s with financial assistance from the federal Public Works Administration. Other large dams are single-purpose hydropower facilities owned by private utilities such as the Montana Power Company. A few reservoirs larger than 5,000 acre-feet were built by private groups for irrigation purposes.

It is clear that water storage has and will continue to solve many water resource problems in Montana. However, its applicability is limited by several factors, including the availability of water, technical feasibility, environmental impacts, and funding.

The planning, construction, operation, maintenance, and rehabilitation of water storage facilities is expensive. Water storage projects must often compete for scarce federal and state funds, and their priority must be determined in light of other water management activities.

THE ROLE OF STORAGE IN WATER MANAGEMENT

Montana's water management problems are diverse and vary according to site-specific conditions. No single water management tool (e.g., water storage, water use efficiency, or water right transfers, or conservation) can effectively and efficiently solve all water management problems. The best water management tool for a particular problem is should be selected through a the following problem-solving process similar to the following (presented here for public review and comment):

1. Define the problem. The water management problem must be adequately and appropriately defined by water users (including municipal, agricultural, recreational, and other appropriate users) and technical experts.
2. Identify all the options to solve the problem, including water storage. Potential water storage projects, both new and existing, could be identified: (1) by working with appropriate government agencies and water user groups to review, evaluate, and update existing lists of potential storage projects; and (2) during the process of developing basin-specific plans.
3. Determine whether water is physically and legally available. Existing water rights must not be adversely affected by the water management tool(s) being considered to solve a problem.
4. Select the option that best meets the following criteria:
 - a. Technical feasibility—Does it solve the problem from a technical perspective?
 - b. Financial feasibility—Do the sponsors have the ability to obtain financing and repay any capital investments as well as the associated operation, maintenance, and rehabilitation expenses?
 - c. Economic feasibility—Do the direct and indirect benefits, both quantifiable and nonquantifi-

able, exceed the direct and indirect costs, both quantifiable and nonquantifiable?

- d. Political feasibility—Is it supported by water users, including municipal, agricultural, recreational, and other affected water users?
- e. Legal feasibility—Can all applicable federal, state, local, and other legal requirements be satisfied?
- f. Environmental feasibility—Does it protect and seek to enhance social, cultural, and ecological values?

Through this problem-solving process, a water storage project could emerge as the best solution to a particular water resource problem. Where that happens, this plan section is designed to facilitate the development of the needed facilities.

This section of the state water plan is divided into three subsections. The first subsection describes how the state should set priorities among water storage projects, allocate state funds among those projects, and ensure that action is taken to complete water storage projects. The second subsection focuses on the financing of water storage projects, while the third subsection addresses the regulatory aspect of developing and rehabilitating water storage projects.

SUBSECTION 1: WATER STORAGE POLICY

BACKGROUND

State water storage policy is to some extent already defined by Montana law. Section 85-1-101(2), MCA declares that *"the public policy of the state is to promote the conservation, development, and beneficial use of the state's water resources to secure maximum economic and social prosperity for its citizens."* Section 85-1-101(4), MCA goes on to say that *"the development and utilization of water resources and efficient, economic distribution thereof are vital to the people in order to protect existing uses and to assure adequate future supplies for domestic, industrial, agricultural, and other beneficial uses."* Finally, Section 85-1-101(6), MCA notes that *"the public interest requires the construction, operation, and maintenance of a system of works for the conservation, development, storage, distribution, and utilization of water, which construction, operation, and maintenance is a single object and is in all respects for the welfare and benefit of the people of the state."*

Although these declarations of policy illustrate the importance of water development and storage to the state of Montana, they do not provide much guidance for selecting which water storage projects to pursue in light of limited state resources. Nor do they ensure that specific actions will be taken by state government to develop priority water storage projects, especially in light of other water management activities.

POLICY STATEMENT

Water storage (including the construction of new projects and the rehabilitation and expansion of existing projects) shall be considered equally with all other practical options in any search for solutions to water resource problems. When the water storage option is determined to be the water management tool that best solves the problem and promotes and enhances the general welfare of the people of Montana, then it should be actively pursued. The pursuit of water storage projects requires a strong and focused commitment by the state. Given the limited resources of the state, priorities must be established among water storage projects in order for the state to be able to make a commitment to the most important water storage projects.

ISSUES, OPTIONS, AND RECOMMENDATIONS

Issue 1 — Prioritizing New Projects

When new water storage projects are selected as the best way to resolve a particular water resource problem, the state faces the question of which projects to focus its limited resources upon. The following options present possible criteria for resolving that question. These criteria are not in any order of priority, recognizing that some may be more important than others on a site-specific basis.

Options

1. Solve the most severe problems.
2. Provide multiple uses and benefits.
3. Provide for public uses.
4. Show strong evidence of broad citizen support.
5. Have the ability to obtain non-state sources of funding.
6. Protect and seek to enhance social, ecological, cultural, and aesthetic values.
7. Improve local and state economic development.
8. Help resolve Indian and federal reserved water rights.
9. Support water conservation activities.
10. Promote the use of water reserved under Montana law.

Recommendation

The priority of new water storage projects should be established according to which projects best satisfy options 1 through 10, realizing that some of the criteria may not apply in some cases.

Issue 2 — Prioritizing Rehabilitation Projects

Several existing water storage projects in Montana are seriously in need of rehabilitation. The rehabilitation of existing projects may also help solve a variety of other water management problems, because projects may be expanded and improved during rehabilitation efforts. However, it

may be difficult to rehabilitate all existing dams due to the cost of such activities.

The estimated cost for rehabilitating several existing water storage facilities in Montana ranges from under \$200,000 to over \$5 million per site. Rehabilitating the Tongue River Dam alone will cost between \$25 million to over \$125 million, depending on the amount of risk to life and property the state and its citizens are willing to assume. The total cost for rehabilitating approximately 35 state-owned high-hazard dams, including the Tongue River Dam, is expected to exceed \$200 million.

In light of the need to rehabilitate existing water storage projects, and the cost of such efforts, the state needs to decide which facilities should be rehabilitated first. One factor affecting the effort to prioritize such projects is the Montana Dam Safety Act. This act defines a "high-hazard" dam as any dam or reservoir that, if it fails, would likely cause a loss of life. The classification of a dam as high-hazard, however, does not determine nor imply whether the dam is structurally safe. Thus, the safety of a particular dam, in addition to its classification as high hazard, must be considered in any scheme to prioritize the rehabilitation of existing water storage projects.

Options

1. Identify the high-hazard projects most needing repair based on the criteria listed under The Role of Storage in Water Management, those listed in Issue 1, and the following criteria:
 - a. Protect public safety
 - b. Impacts of not repairing project
2. Breach high-hazard dams that cannot be repaired with a positive benefit-to cost ratio.
3. Rehabilitate all unsafe high-hazard dams by the year 2000.

Recommendation

Option 1. The priority of rehabilitation projects should be established according to which projects best satisfy the criteria outlined in Option 1, realizing that some of the criteria may not apply in some cases.

Issue 3 — Allocating State Funds

As mentioned above, water storage projects must compete with other water management activities in terms of state and federal assistance. In addition, water storage

projects must compete among each other for limited state and federal financial and technical resources. Although the state has a limited ability to determine how federal resources are allocated, it can set priorities for allocating state funds. The question is, given the amount of state funding available for water storage projects, how should these funds be allocated? A related question, how to increase the amount of state funding available for water storage projects, is addressed in the next subsection on financing water storage projects.

Options

1. Allocate the state funds available for water storage solely to rehabilitate existing water storage projects, particularly unsafe, high-hazard facilities.
2. Allocate the state funds available for water storage solely to plan and construct new water storage facilities.
3. Allocate a certain percentage of the state funds available for water storage for onstream, offstream, and nonstructural types of storage.
4. Allocate the state funds available for water storage based on the following order of preference:
 - a. Resolve threats to life and property posed by high-hazard facilities that are in an unsafe condition.
 - b. Improve and/or expand existing water storage facilities.
 - c. Plan and construct new water storage facilities.

Recommendation

Option 4. This approach recognizes the importance of rehabilitating unsafe, high-hazard dams, but also allows for other water storage activities.

PLAN IMPLEMENTATION

Legislative Action

The legislature needs to enact legislation that explains the role of storage in water management, including the generic problem-solving process outlined above. The legislature also needs to enact legislation outlining the criteria for prioritizing new storage projects and rehabilitation projects. The legislation should specify that the Governor's Office, in cooperation with the legislature, will have final authority for prioritizing all water storage projects.

The legislature also needs to enact legislation specifying that state funds available for water storage should be allocated according to the preferences described above.

Administrative Action

The Department of Natural Resources and Conservation needs to prepare a progress report on water storage activities and submit it to each general session of the legislature. The report should include, at a minimum: (1) the list of water storage project priorities as determined by the gover-

nor and the legislature; (2) an implementation strategy for each priority project that identifies the resources, government actions, and political support needed to accomplish the project; and (3) the status of the priority projects.

Financial Requirements and Funding Strategies

The implementation of this subsection does not require any additional funding beyond that needed for the water storage projects themselves.

Plan Implementation Summary

<u>Activity</u>	<u>Responsibility</u>	<u>Deadline</u>
General		
Enact legislation that explains (1) the role of water storage in water management; and (2) the generic water resources problem-solving process	Legislature	April, 1991
Develop a report on water storage activities each biennium	DNRC	Ongoing
Issue 1 - Prioritizing New Projects		
Enact legislation outlining the criteria for prioritizing new water storage projects	Legislature	April, 1991
Prioritize new storage projects	Governor and legislature	Ongoing
Issue 2 - Prioritizing Rehabilitation Projects		
Enact legislation outlining the criteria for prioritizing the rehabilitation of existing water storage projects	Legislature	April, 1991
Prioritize rehabilitation projects	Governor and legislature	Ongoing
Issue 3 - Allocating State Funds		
Enact legislation outlining the preferences for allocating state funds for water storage projects	Legislature	April, 1991

SUBSECTION 2: WATER STORAGE FINANCING

BACKGROUND

The cost of constructing, operating, maintaining, and rehabilitating water storage facilities varies tremendously depending on their size, location, and site-specific geological and hydrological conditions. In light of this variation, the next several paragraphs illustrate the range of costs, in 1988 dollars, for developing, maintaining, and rehabilitating water storage projects (see Table 1).

The construction costs of existing water storage projects in Montana (excluding small stockwater and fish ponds) ranges from approximately \$50,000 (for Sturgis Dam) to \$258 million (for Yellowtail Dam). The construction costs of the majority of existing water storage facilities falls in the range of approximately \$1 million to \$4.5 million. The cost per acre-foot (based on total storage capacity) ranges from about \$45 (at Canyon Ferry) to \$2,400 (at Pike Creek Dam).

The annual cost for operating and maintaining existing water storage facilities ranges from about one-half to one and one-half percent of the total cost of construction on an annual basis. Rehabilitating and replacing water storage facilities are also expensive. The estimated cost for rehabilitating existing water storage facilities in Montana was outlined in Subsection 1, Issue 2. While historically there have been inadequate funds available for operating and maintaining some water storage facilities, funds are generally unavailable to rehabilitate and replace nearly all water storage facilities.

Finally, the estimated cost of constructing reasonably large new water storage facilities in Montana ranges from nearly \$10 million for the Johnson Creek site (with a firm annual yield of 5,000 acre-feet) to over \$215 million for the Sunday Creek site (with a firm annual yield of 215,600 acre-feet). The annual cost per acre-foot of yield (based on firm annual yield) ranges from \$38 at the Reichle Dam site (with a firm annual yield of 140,000 acre-feet) to \$378 at the Buffalo Creek site (with a firm annual yield of 27,480 acre-feet).

The estimated cost of constructing several much smaller new water storage facilities (ranging in size from approximately 5,000 acre-feet to 25,000 acre-feet) falls in a range of \$1 to \$10 million. The annual cost per acre-foot for these smaller facilities falls into a range of \$100 to \$1,000, with most of them being around \$500. The annual cost per acre-foot for a few water storage facilities, however, has been estimated at less than \$100.

Historically, federal and state governments helped initiate the development of water storage facilities by providing the necessary up-front funds for project planning and construction. Beneficiaries of the completed water storage projects then repaid, in the form of user fees, some or all of the costs attributable to such benefits (i.e., agriculture has generally repaid 10 to 100 percent on specific projects, while hydropower has generally paid 100 percent). Although many water storage projects provide fish, wildlife, recreation, and other environmental benefits, as well as flood control and navigation benefits, these direct beneficiaries have had to pay little of the cost of these benefits

Table 1. Costs of Water Storage Projects

<i>Existing Projects</i>				
<u>Construction</u>	<u>Cost/Acre-foot (total storage capacity)</u>	<u>Operation & Maintenance</u>	<u>Rehabilitation</u>	<u>Rehabilitation of 35 State-owned Projects*</u>
\$50,000 to \$258 million	\$45 to \$2,400	one-half of 1% of construction	\$200,000 to \$125 million	\$200 million

* This total includes \$125 million for one project, the Tongue River Dam.

<i>New Projects</i>			
<u>Construction of Large Projects</u>	<u>Cost/Acre-foot of Large Projects (firm annual yield)</u>	<u>Construction of Smaller Projects</u>	<u>Cost/Acre-foot of Smaller Projects (firm annual yield)</u>
\$10 to \$215 million	\$38 to \$378	\$1 to \$10 million	\$100 to \$1,000

(e.g., existing recreational user fees generally do not help pay for the costs of water storage facilities). Rather, these benefits have been paid for largely by the general taxpayer.

Although the federal government's interest in financing water storage projects has recently waned, there are still several funding and technical assistance programs administered by federal agencies such as the Soil Conservation Service's watershed management program and the Bureau of Reclamation's technical assistance program. In addition, the state of Montana administers several programs for funding water management activities, including water storage projects.

POLICY STATEMENT

Financing water storage is an important aspect of water development in Montana. The State of Montana should focus resources on understanding, coordinating, and improving funding programs for water storage development, operation, maintenance, and rehabilitation. Although specific financing packages must be developed on a site-specific basis, all beneficiaries should be considered for a responsible role in repaying the cost of water storage projects. The financial costs of operating and maintaining water storage facilities should be assured prior to construction, and the costs of rehabilitation and replacement should also be considered.

ISSUES, OPTIONS, AND RECOMMENDATIONS

Issue 1 - Information, Education, and Assistance

Although there are a variety of federal, state, local, private, and other sources of funding for water storage projects, it is currently very difficult to find one person or organization that understands all of the programs. As a result, potential project sponsors are unaware of and do not understand the conditions under which financing is available in the various programs.

Options

1. Document existing programs. Creating and updating a directory may facilitate the financing of water storage projects.
2. Provide public information and education on the availability of programs for financing new and existing water storage projects, in addition to the

costs and benefits of water storage projects. This campaign would specify what funds are available and under what conditions.

3. Create a committee of diverse interests to facilitate efforts to finance water storage projects. This committee could serve as a clearinghouse for (1) providing public information and education, (2) developing financial packages for finding water storage projects, and (3) coordinating permitting and regulatory issues related to water storage development. This committee might be coordinated and staffed by the Department of Natural Resources and Conservation (DNRC), the Montana Water Resources Association, the Environmental Quality Council, the Water Resources Research Center, or some other organization.
4. Designate a person (in the Department of Natural Resources and Conservation, the Montana Water Resources Association, the Environmental Quality Council, or the Water Resources Research Center) as a "water storage development coordinator" to facilitate efforts to develop water storage projects. This person would serve in the same capacity as the committee described above.

Recommendation

Options 1 and 4. These options are likely to have the greatest impact on financing water storage projects. However, the options that were not selected may also be desirable or feasible.

Issue 2 - State Water Resource Funding Programs

The Department of Natural Resources and Conservation administers several grant and loan programs for a variety of water management activities, including water storage. One is the Water Development Program (WDP). According to Montana law, "*the water development program is the key implementation portion of the state water plan and shall be administered to accomplish the objectives of the plan*" (Section 85-1-602, MCA). It goes on to say that "*The storage of water for existing and future beneficial uses shall be given the highest priority [for funding] unless a water development project or activity designed to accomplish another objective is demonstrated to be more beneficial to a greater number of people*" (Section 85-1-602, MCA).

A second program is the Renewable Resource Development (RRD) Program. This program provides grants for

the development of all types of renewable resources, including water. A third program is the Reclamation and Development Grant (RDG) Program. This program is designed to fund projects that mitigate the impacts of mining or meet other "crucial state needs." It is conceivable that water storage could be considered part of a reclamation program under the "crucial state need" category, but most water storage projects probably fit better under the Water Development Program or the Renewable Resource Development Program. The principle source of funding for each of these programs are taxes on the extraction of non-renewable resources.

The majority of funds potentially available under these funding programs are not allocated to water storage projects for two primary reasons. First, the Montana Legislature has diverted a significant amount of the funds originally intended for these programs to other, ongoing state programs, primarily the administration of state agencies (see Table 2). Since 1984, over \$41 million dollars was deposited in the accounts created for the WDP and RRD programs. However, only about \$19 million was allocated as grants. The trend has been that more and more of the funds deposited in the accounts are being used for other programs, and, consequently, less are available for water projects.

Second, there has been a lack of applications for water storage projects, and, consequently, available funds are allocated to other types of water projects (see Table 3). Of the slightly more than \$19 million that has actually been

Table 2. Allocation of Funds Authorized for the WDP, RRD, and RDG Programs

	<u>FYs 1984-91</u>	<u>FYs 1990/91</u>
Authorized	\$41 million	\$15.7 million
Allocated as Grants	\$19 million	\$4.6 million
Used to Fund State Agencies	\$22 million	\$8 million
Used to Fund Water Storage*	\$405,000	\$93,000

* These amounts are included in funds allocated as grants

available for grants, a total of only about \$400,000 has been used to fund water storage projects. Since the inception of the programs in 1984, a total of 32 applications have been received for loans and grants to fund water storage projects. Twenty-nine of these applications have been completely funded. Under the Water Development Program, six water storage projects have been granted about \$350,000. By contrast, 70 other projects, including municipal and rural water and sewer systems, streambank stabilization, and groundwater studies, have received about \$4 million.

Table 3. Allocation of Grants and Loans from 1984 to 1991

	<u>Water Storage Projects</u>	<u>Other Projects</u>	<u>Total</u>
Water Development Grant Program	\$350,000 (6 projects)	\$4 million (77 projects)	\$4.4 million (83 projects)
Renewable Resource Development Grant Program	\$55,000 (2 projects)	\$3.7 million (62 projects)	\$3.8 million (64 projects)
Water Development Public Loan Program	\$312,000 (3 projects)	\$22 million (46 projects)	\$22.3 million (49 projects)
Water Development Private Loan Program	\$175,000 (1 project)	\$4.1 million (69 projects)	\$4.3 million (70 projects)
Reclamation and Development Grant Program	0	\$10.8 million	\$10.8 million
Total	\$892,000	\$44.6 million	\$45.6 million

Under the Renewable Resource Development Program, 49 projects have been funded at a total cost of over \$1 million. At the same time, only two water storage projects have been funded under this program at a total cost of about \$55,000.

Under the Water Development Public Loan Program (which is financed by the sale of bonds backed by the coal severance trust fund), three water storage projects have been funded at a total cost of about \$312,000. By contrast, 46 other projects have been funded under this program at a total of over \$22 million.

Under the Water Development Private Loan Program (which is financed in part by RRD funds and the sale of general obligation bonds), 70 loans have been approved for a total of \$4.3 million, including one irrigation storage project at a cost of about \$175,000. Approximately \$5.5 million is available each biennium under the Reclamation and Development Grants Program, but to date no water storage projects have been funded.

The issue on financing in the previous section of this plan focused on how to allocate the funds available for water storage. The purpose of this issue is to explore opportunities for increasing the available amount of such funds.

Options

1. Continue public information and education on the availability of funds under these programs.
2. Encourage potential project sponsors to apply for funds.
3. Support legislative and administrative enforcement of the statutory priority for water storage projects under the Water Development Program.
4. **Create a new special revenue account (the "Water Storage Special Revenue Account") to be used exclusively for funding water storage projects. The new account would receive 25 percent of the deposits to each of the Water Development Special Revenue Account and the Renewable Resource Development Account. The funds in the Water Storage Special Revenue Account would be expended as authorized under current water development accounts, including grants, loans, and to underwrite bonds.**
5. If the funds deposited in the new "Water Storage Special Revenue Account" are not used during a given biennium, the funds should be allocated to other state programs.
6. If the funds deposited in the new "Water Storage Special Revenue Account" are not used during a

given biennium, the funds should accumulate rather than be transferred to other programs.

7. **Seek authorization for allocating a higher percentage of existing non-renewable resource funds (e.g., coal severance tax revenues) to the development of Montana's renewable resources, particularly water.**
8. Encourage state government to take a more active role in initiating water storage projects.
9. **Authorize the use of 25 percent of the funds over and above the statutory cap of \$100 million on the Resource Indemnity Trust (RIT) Fund for water storage projects that mitigate impacts from industries that have paid the tax.**
10. **Delete the \$100,000 cap on Water Development Program Grants for water storage projects, as currently outlined in DNRC administrative policy.**

Recommendation

Options 4, 6, 7, 9, and 10. These options are likely to have the greatest impact on financing water storage projects. However, the options that were not selected may also be desirable or feasible.

Issue 3 - Cost-sharing and Coordination

When federal funds for water storage development are available, state and local entities are usually required to provide matching funds. However, it is often very difficult for state and local entities to come up with their appropriate share of funds. In view of this situation, the options outlined below are designed to (1) improve the ability to satisfy the cost-sharing requirements; (2) generate funds for operating, maintaining, rehabilitating, and replacing existing storage facilities; and (3) generate funds for constructing projects without federal financial aid.

Options

1. Pursue water storage projects only if they have local and state support and a realistic ability to comply with federal cost-sharing requirements.
2. Creatively utilize all available state, local, and private sources of funding to satisfy federal cost-sharing requirements.
3. **Encourage Resource Conservation and Development areas (RC&Ds) to develop funding packages and create broad-based coalitions to support water storage development.**

4. Statutorily create water storage districts (similar in concept to irrigation and conservancy districts) that would have the power to tax and collect fees for purposes of funding water storage projects.
5. Establish, on a site-specific basis, special improvement districts, rural improvement districts, conservancy districts, multi-conservation district special project areas, or some combination thereof to help raise funds for water storage projects.
6. Identify potential sources of private sector funding and integrate these on a site-specific basis. These sources might include contributions from various water user groups, such as irrigators, industries, recreationists, conservation and preservation groups, and others.
7. Increase state taxes and designate the additional funds to water storage development.
8. Encourage the state or a coalition of private investors to purchase federally owned water storage projects and operate them to generate funds for operation, maintenance, and new storage projects.

Recommendation

Options 3, 4, and 6. These options are likely to have the greatest impact on financing water storage projects. However, options that were not selected may also be desirable or feasible.

Issue 4 - Payment by Beneficiaries

If water storage projects are to be developed or rehabilitated in the future, a diversity of funding sources will be needed. In addition to using federal, state, and private funds, another possibility is to encourage or require all beneficiaries to play a responsible role in financing the projects. The funds generated from this approach could be used to help finance a portion of water storage projects, including planning, construction, operation, maintenance, rehabilitation, and replacement.

The funds raised under any one of the following options would not generally be relied on to repay the entire cost of a project.

Options

1. Continue having irrigation, hydropower, municipal, and industrial beneficiaries repay some of the project costs through user fees, and allow

the sponsor together with the funding source to make site-specific recommendations on whether those fees will adequately cover the costs of the benefits.

2. Assess the feasibility, via a study, for having recreational beneficiaries repay some of the project costs ~~through user fees~~. Among the options that might be assessed are:
 - a. A fee, on a site-specific basis, to individuals who take advantage of the recreational benefits associated with water storage projects funded with public resources. Like an entrance fee to a state or national park, the fee would be assessed each time a person participates in some recreational activity related to the water storage project. An annual user's pass would also be available for each site. The funds generated from the fee would be designated for water storage development that includes recreational or fish and wildlife benefits.
 - b. A "water development" stamp. This stamp would be required of anyone purchasing a fishing, duck hunting, boat, or other water-related license. The funds generated from this stamp would be designated for water storage development that includes recreational or fish and wildlife benefits. Such funds would have to be controlled in a manner consistent with state-federal requirements outlined in Section 87-1-701-714, MCA.
 - c. An increase in the Motorboat Fuels Tax to be used for water storage development that includes recreational or fish and wildlife benefits.
 - d. A generic "land and water conservation" license for anyone using public lands or water. At least some of the money generated from these licenses would be designated for water storage development that includes recreational, fish and wildlife, and/or environmental benefits. Such funds would have to be controlled in a manner consistent with state-federal requirements outlined in Section 87-1-701-714, MCA.
 - e. The Department of Fish, Wildlife and Parks providing appropriate funds on an individual project basis through agency funding mechanisms.
3. Continue to use ~~general~~ tax revenues to provide a portion of fish, wildlife, recreational, and other environmental benefits associated with water storage projects.

4. Continue to use ~~general~~ tax revenues to provide flood control and navigation benefits associated with water storage projects.
5. Continue to use ~~general~~ tax revenues to provide a portion of the irrigation, municipal, industrial, and hydropower benefits associated with water storage projects.
6. Charge individuals and groups that benefit from the flood control and navigation benefits of a new water storage project. Create one of the several resource districts possible under Montana law to collect fees and/or require beneficiaries to pay taxes.
7. Require downstream states to financially compensate Montana for the impacts of upstream reservoirs that largely benefit downstream users.

Recommendations

Options 1, ~~2, 2a, 2b, 2c,~~ 3, 5, and 6. These options are likely to have the greatest impact on financing water storage projects. However, options that were not selected may also be desirable or feasible.

Issue 5 - Economic Value of Alternative Uses

The appropriate role of each beneficiary in financing water storage projects might be based on the economic value of the benefits received and the ability of the beneficiary to pay. The problem is that, while it is relatively easy to determine the economic value of hydropower, municipal, and agricultural uses of water, it is much more difficult to estimate the economic value of secondary benefits (e.g., local and state economic development) and other direct benefits (e.g., recreation; fish and wildlife protection; wetlands and riparian habitat preservation; augmentation of flows for water quality, instream flow protection, groundwater recharge, and late season irrigation; and downstream navigation).

Options

1. Conduct research designed to identify all the potential benefits associated with water storage projects, estimate the economic value of all these benefits on a per acre-foot basis, assess the validity of methods used to estimate such values, and generate data that can be meaningfully compared (e.g., estimate all the values in terms of acre-feet).
2. Conduct research designed to estimate the value of secondary economic benefits related to water

storage development, such as rural and local economic development.

Recommendation

No recommendation. While this is an important issue, it is not a high priority. It could be integrated into the study outlined in Issue 4, Option 2.

PLAN IMPLEMENTATION

Legislative Action

The legislature needs to authorize one new staff position for a "water storage development coordinator" in the Department of Natural Resources and Conservation.

The legislature needs to create a "Water Storage Special Revenue Account" and amend Section 85-1-601 et seq., MCA to allocate 25 percent of the Water Development Special Revenue Account to the new account. Section 90-2-101 et seq., MCA, which deals with the Renewable Resource Development Account, needs to be similarly amended. The legislation should specify that the funds in this account will be used exclusively for water storage projects. In addition, the legislation should specify that, if these dedicated funds are not used during a given biennium, they should accumulate rather than being used to support other programs.

The legislature needs to reallocate more non-renewable resource funds (e.g., coal severance tax revenues) to the development of renewable natural resources, particularly water. The legislature also needs to adopt a provision in Section 85-1-604 and Section 15-38-202, MCA to authorize the use of 25 percent of the funds over and above the statutory cap of \$100 million on the revenue from the Resource Indemnity Trust for water storage projects.

The legislature needs to pass legislation authorizing the creation of local water storage districts that would have the power to tax and collect fees for purposes of funding water storage projects.

Administrative Action

The Department of Natural Resources and Conservation needs to hire (or, in the event that the legislature does not authorize a new position, the DNRC would need to reallocate an existing position for) a water storage development coordinator to document existing federal, state, local, private, and other sources of funding for water storage projects; facilitate efforts to develop water storage projects;

identify potential sources of funding in the private sector and include these in funding packages for specific projects; help develop a biennial report on water storage activities, as outlined in Subsection 1; and perform other duties as assigned.

The Department of Natural Resources and Conservation needs to revise its policy of limiting grant awards under the Water Development Program to \$100,000.

The Department of Fish, Wildlife and Parks, in cooperation with the Department of Natural Resources and Conservation, needs to study the feasibility for having recreational beneficiaries repay some of the project costs through user fees.

Resource Conservation and Development Areas and Water Storage Districts need to develop funding packages and support water storage development. They also need to

develop mechanisms to charge flood control and navigation beneficiaries.

Water storage development sponsors should continue to use general tax revenues for a portion of irrigation, hydropower, municipal, industrial, fish, wildlife, recreational, and other environmental benefits related to water storage projects.

Financial Requirements and Funding Strategies

Sufficient funds will need to be authorized both legislatively and administratively to hire a water storage development coordinator and for the coordinator to carry out his or her responsibilities. Adequate funds will need to be authorized to conduct a study on the feasibility of recreational user fees.

Plan Implementation Summary

<u>Activity</u>	<u>Responsibility</u>	<u>Deadline</u>
Issue 1 - Information and Education		
Hire a water storage development coordinator	Legislature and DNRC	June, 1991
Document programs	Water storage development coordinator	January, 1992
Issue 2 - Water Development Programs		
Create a water storage special revenue account	Legislature	April, 1991
Reallocate more non-renewable resource funds to renewable resource development	Legislature	April, 1991
Authorize RIT funds for water storage	Legislature	April, 1991
Delete the \$100,000 cap for Water Development Program grants	DNRC	June, 1991
Issue 3 - Cost-sharing and Coordination		
Create Water Storage Districts	Legislature	April, 1991
Develop funding packages and coalitions	RC&Ds and Water Storage Districts	Ongoing
Integrate private sources of funding	Water storage development coordinator	Ongoing
Issue 4 - Payment by Beneficiaries		
Assess the appropriateness of fees paid by irrigation, hydropower, municipal, and industrial beneficiaries	Water storage development coordinator	Ongoing
Conduct a study on recreational user fees	DFWP and DNRC	July 1991
Charge flood control and navigation beneficiaries	RC&Ds and Water Storage Districts	Ongoing
Use general tax revenues for a portion of irrigation, hydropower, municipal, and industrial, fish, wildlife, recreational, and other environmental benefits	Water storage development sponsors	Ongoing

SUBSECTION 3: WATER STORAGE REGULATIONS

BACKGROUND

The planning, construction, operation, maintenance, and rehabilitation of water storage facilities in Montana is regulated by a multitude of federal, state, and local laws and administrative rules as well as international, interstate, and tribal treaties and compacts. In those laws, rules, and agreements, various requirements are designed to protect public interests in water appropriation and use, health and safety, environmental conservation, and cultural site preservation.

Examples of regulations that protect the interests of Montana's citizens include the Montana Water Use Act, which provides for the granting of water rights for a wide diversity of beneficial water uses including water stored for irrigation, hydropower, and recreation. Other laws regulate water storage by requiring minimum streamflows to maintain water quality and by governing construction of storage facilities to protect public health and safety. Examples include the Federal Safe Drinking Water Act, the Federal Power Act, the Montana Dam Safety Act, and local flood plain ordinances. Laws such as the Federal Endangered Species Act, Wild and Scenic Rivers Act, and National Historic Preservation Act guard environmental and cultural values by prohibiting storage or requiring mitigation where storage may impact natural resources, important wildlife species, or historical sites.

The state also has obligations under international, interstate, and tribal treaties and compacts that may limit the availability of water for storage. For example, the 1909 Boundary Waters Treaty between the United States and Canada provides for the division of flows in the Milk and St. Mary rivers. The Yellowstone Compact is an interstate agreement allocating basin water between Montana, Wyoming, and North Dakota. Indian tribes have rights to use water under state and federal laws.

The laws, regulations, and agreements applicable to water storage are summarized in the water storage regulations background document which is available from the DNRC upon request. A preliminary review indicated that some requirements may unduly hinder water storage development in Montana. The identified issues are addressed in this water plan section.

POLICY STATEMENT

Water storage is one of several tools available for managing Montana's water resources. A substantial number of laws and regulations affect water storage activities and

are necessary to protect vital public interests and environmental values. The state of Montana should act to ensure that laws and regulations are reasonable and properly administered to allow for the use of storage as a viable water management tool.

ISSUES, OPTIONS, AND RECOMMENDATIONS

Issue 1 - Duplicative Laws and Regulations

Some laws and regulations contain duplicative requirements, result in overlapping administrative authorities, and set forth conflicting definitions. For example, high-hazard dams in Montana located on certain national forest land are governed by similar requirements under the Montana Dam Safety Act, Federal Land Policy and Management Act, and federal Wilderness Act. In addition, definitions of such terms as "navigable" and "stream bed" differ between laws and may be inconsistent. As a result, water storage development and operation may be unnecessarily cumbersome and confusing.

Options

1. Identify unnecessary duplications and inconsistencies and recommend corrective measures. This evaluation could address one or more of the following issues.
 - a. Identify duplicative requirements, overlapping administrative jurisdictions, and inconsistent definitions of common terms.
 - b. Identify federal laws whose administration could be assumed by the state to improve efficiency and enhance sensitivity to local problems and concerns.
 - c. Identify overlapping state regulatory authority.
2. Designate a lead agency to coordinate all water storage permitting.
3. Take no action. The existing requirements, authorities, and definitions are appropriate to manage the resource.

Recommendation

Option 1. The evaluation and corrective measures will streamline regulation of water storage development.

Issue 2 - Costs Related to Dam Safety

Structural repairs or construction of existing and proposed high-hazard dams may be prohibitively expensive. One factor affecting costs are dam safety regulations. The Montana Dam Safety Act establishes the degree of risk to life and property that is acceptable with respect to a high-hazard dam, defined as any dam or reservoir that, if it fails, would likely cause a loss of life. Classification as a high-hazard dam does not imply nor determine whether or not the dam is structurally sound. If risks to public safety are increased—for instance, accepting more than one lost life or allowing a lower minimum spillway capacity—the costs of rehabilitating existing dams and building new facilities would decrease. Conversely, increased safety raises costs. In general, the administrative rules implementing the Montana Dam Safety Act require high-hazard dams to satisfy federal standards. However, standards in the Montana Dam Safety Act for designing spillways are less stringent than federal standards.

The administrative rules implementing the Montana Dam Safety Act require that, by July 1, 1995, existing high-hazard dams, as identified by the Corps of Engineers in 1981, must obtain an operating permit from the Department of Natural Resources and Conservation verifying that the dams satisfy safety standards. To date, studies have been completed on only approximately 33 of 85 high-hazard reservoirs to determine the modifications needed to satisfy the standards. Costs of rehabilitating state-owned high-hazard dams is expected to exceed \$200 million. The costs of engineering studies and rehabilitation construction may be prohibitively expensive, thereby causing a delay or an inability to meet dam safety standards.

Options

1. Revise the Montana Dam Safety Act to increase the acceptable degree of risk to public safety and to reallocate responsibility for that risk between the public, government, and dam owners.
2. Repeal the Montana Dam Safety Act and defer all dam safety activities to the federal government.
3. Evaluate the Montana Dam Safety Act and implementing regulations to:
 - a. Determine the acceptable degree of risk to public safety and appropriate allocation of responsibility for that risk between the public, government, and dam owners.
 - b. Determine whether the definition of a high-hazard dam should be modified.
 - c. Determine whether the high-hazard classification should be expanded into a risk scale that allows structural design requirements to reflect probable risk to life and property.
 - d. Determine whether the Department of Natural Resources and Conservation should be given greater discretion to substitute alternative means of addressing risks, such as early warning systems, for structural design requirements.
4. Take no action. The current provisions of the Montana Dam Safety Act appropriately address dam safety concerns.

Recommendation

Option 3. Dam safety is an important public policy issue, and acceptable risks to public safety must be determined. In recommending Option 3, the State Water Plan Advisory Council acknowledges that the DNRC should assess alternative means of addressing risks, such as requiring early warning systems and balancing risks with consequential costs, and initiate rulemaking as appropriate.

Issue 3 - Inability of Private Entities to Obtain Water Reservations

Under the Montana Water Use Act, only public entities may apply to reserve water for existing and future beneficial uses, including those involving the storage of water. Private entities are prohibited from directly obtaining water reservations. Another way to secure water for future uses is to extend the time limit for developing water rights. Excluding private entities from acquiring water reservations may preclude some private development of water storage having public benefits. In addition, while the Montana Water Use Act allows water reservations for multi-purpose uses, there may be perceptions that water reservations are for single-purpose uses only.

Options

1. Revise the Montana Water Use Act to allow private entities to obtain water reservations.
2. Revise the Montana Water Use Act to extend the 10-year limit on developing water use permits associated with water storage development.
3. Provide public education to encourage water reservations for multipurpose uses.

4. Designate or create a public body to advance water reservation applications for private entities.
5. Evaluate the Montana Water Use Act and the desirability of:
 - a. Allowing private entities to obtain water reservations.
 - b. Designating or creating a public body to advance water reservation applications for private entities.
6. Take no action. The Montana Water Use Act appropriately guides beneficial water uses.

Recommendation

Options 2, 3, and 5. By extending the time limit for developing water rights associated with water storage, private development of storage projects will be facilitated. The policy restricting water reservations to public entities should be re-evaluated to determine whether the public use preference should stand.

Issue 4 - Lack of Information about Water Storage Laws

No comprehensive source of information exists on the laws and regulations affecting the development and operation of water storage projects. Consequently, potential project developers may be unaware of the legal requirements that must be met as well as the resources available for assistance. Development of water storage projects may be facilitated by easy access to this information.

Options

1. Prepare, distribute, and regularly update (1) a **listing directory of laws and regulations applicable to water storage**, and (2) a **booklet describing the major requirements and identifying administrative agencies**; both suitable for use by laypersons.
2. Develop and administer a targeted program of education to promote awareness of legal requirements and sources of information applicable to the development and operation of water storage projects.
3. Designate a person to serve as an information coordinator for permitting and regulatory issues related to water storage development.

Recommendation

All options. These activities would make information accessible and assist in the proper development of water storage facilities.

Issue 5 - Repairing Wilderness Area Dams

Rules and regulations pursuant to the Wilderness Act may constrain the maintenance or rehabilitation of dams in wilderness areas. The use of mechanized equipment in designated wilderness areas for maintenance or rehabilitation is prohibited, except where such use was practiced prior to wilderness designation or is authorized by the Chief of the Forest Service under specifically approved guidelines. There are 16 dams in Montana's wilderness areas that potentially threaten public safety, and others may exist in future wilderness designations.

Potential problems related to dams located in wilderness areas include (1) regulations governing wilderness areas may hinder dam maintenance, (2) rule implementation may impede dam maintenance, (3) dam owners may not understand the regulations affecting the use of mechanized equipment to maintain dams, and (4) dam owners, for any number of reasons, may not be willing or able to comply with wilderness area regulations. Any one or combination of these problems has, in some cases, led to dams deteriorating to the point where they may threaten public safety.

Options

1. Develop an informational program describing the application procedure for the use of mechanized equipment and other rules applicable to dam repair in wilderness areas.
2. Develop a training program for state and federal administrators to promote better implementation of regulations governing wilderness areas.
3. Develop more detailed guidance in the wilderness regulations promoting public safety through dam maintenance procedures.
4. Develop a public process, which may include the U.S. Forest Service, Bureau of Land Management, Department of Natural Resources and Conservation, dam owners, conservationists, consultant firms, and other interested persons, to identify problems and develop appropriate solutions.

Recommendation

Option 4. Since the nature and scope of the problem is unclear, further examination by affected parties is necessary.

PLAN IMPLEMENTATION

Legislative Action

The Water Policy Committee needs to reevaluate the acceptable degree of risk to public safety under the Montana Dam Safety Act. The Water Policy Committee also needs to consider the public policy of extending water reservations to private entities under the Montana Water Use Act.

The legislature needs to revise the Montana Water Use Act to extend the 10-year limit on developing water use permits associated with water storage development.

Administrative Action

The Department of Natural Resources and Conservation needs to evaluate federal, state, and local laws and regulations applicable to water storage to identify duplicative requirements, overlapping administrative authorities, and conflicting definitions and make reports and recommendations to the State Water Plan Advisory Council, Board of Natural Resources and Conservation, Legislative Water Policy Committee, and legislature as appropriate.

The Department of Natural Resources and Conservation needs to draft administrative rule changes to implement decisions of the Legislative Water Policy Committee.

The Department of Natural Resources and Conservation and the Montana Water Resources Center need to develop and administer a targeted education program to: (1) encour-

age water reservations for multipurpose uses, and (2) promote awareness of legal requirements and sources of information applicable to the development and operation of water storage projects.

The Department of Natural Resources and Conservation needs to prepare, distribute, and regularly update (1) a listing of laws and regulations applicable to water storage, and (2) a booklet that describes the major requirements and identifies administrative agencies; both suitable for use by laypersons.

The Department of Natural Resources and Conservation needs to designate an individual to serve as an information coordinator for permitting and regulatory issues related to water storage development.

The Department of Natural Resources and Conservation needs to develop, in cooperation with appropriate federal and state agencies, a public process to identify problems associated with the maintenance of dams in wilderness areas and develop appropriate solutions.

Financial Requirements and Funding Strategies

The legislature needs to provide adequate funding for the Water Policy Committee to conduct a water storage regulation study. Approximately \$5,000 is needed during the 1991-92 biennium for the Department of Natural Resources and Conservation to print and distribute the water storage regulation ~~matrix~~ directory and booklet.

Plan Implementation Summary

<u>Activity</u>	<u>Responsibility</u>	<u>Deadline</u>
Issue 1 - Duplicative Laws and Regulations Water Storage Regulation Study	DNRC	November, 1992
Issue 2 - Costs Related to Dam Safety Water Storage Regulation Study	Legislative Water Policy Committee DNRC	November, 1992
Issue 3 - Inability of Private Entities to Obtain Water Reservations Water Storage Regulation Study Public Education	Legislative Water Policy Committee DNRC and Montana Water Resources Center	November, 1992 January, 1992/ Ongoing
Issue 4 - Lack of Information about Water Storage Laws Designate a water storage coordinator Prepare and distribute water storage regulation listing <u>directory</u> and booklet Public education	DNRC Water storage coordinator Water storage coordinator	June, 1991 January, 1992 January, 1992/ Ongoing
Issue 5 - Inability to Repair Wilderness Area Dams Sponsor a public forum	Governor's Office DNRC U.S. Forest Service	December, 1990

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INTRODUCTION

Montana's water supplies vary from year to year. Some years there is too much water and flooding occurs. In other years, there is too little water and drought results. Drought is an inevitable part of Montana's climate. It will happen again as it has happened in the past.

Most Montanans understand that drought is inevitable. This does not mean that they can do nothing to reduce drought effects. Although the state may not be able to make it rain or snow, it can help its citizens prepare for and minimize the effects of drought.

The questions are whether, how, and when the state should use its authority to ease the effects of drought. This section of the state water plan proposes an answer to these questions. A policy is proposed that defines the proper role of the state in drought management. Then, this plan section recommends specific actions to fulfill that role.

BACKGROUND

Drought threatens all water needs. Dryland agriculture is particularly vulnerable. Drought also increases the threat of wildfire. These drought-related impacts arise primarily from soil moisture deficiencies. However, the most controversial drought issues typically surround the use of water from our streams, lakes, and aquifers.

The prior appropriation doctrine determines who gets to use scarce water from these sources. This doctrine of "first in time is first in right," which will continue to be the basis for water allocation and use in the state, assigns priority to water uses based solely on the date of appropriations. Given the unadjudicated status of most water rights in Montana, drought presents several problems for Montana water users. These problems include: (1) procedural difficulties in enforcing unadjudicated water rights; (2) the expense of beginning to enforce water rights in areas that historically lacked enforcement; (3) a lack of water conservation incentives in the law; and (4) legal restrictions and practical difficulties associated with changes in the use of water rights.

Under these circumstances, how can important water uses be protected? In extreme, life-threatening emergencies, the government has the authority to take water rights, with pay, to protect the public good. Such a situation is better avoided. Less intrusive ways to cope with the effects of drought, or possibly to prevent them, are preferred.

Another approach is to better inform water users about the probability of drought. Where drought appears likely,

water users may be asked to consider options that would minimize their risk and extend limited water supplies. This approach requires planning. Planning may also reduce the vulnerability of agriculture and forests to drought. Because drought occurs with greater warning and frequency than other kinds of disasters, planning has great promise for reducing its effects.

Much was learned in recent years about the types of impacts and conflicts that are likely during drought. Perhaps the most important lesson is that the best time to reduce the impacts of drought is before they happen. Recent experience has shown the need for a larger box of tools to prevent and mitigate drought-related problems.

POLICY STATEMENT

It is the policy of the State of Montana to support proactive drought management at the local level to protect the natural resources, economic base, and lifestyles of Montana citizens. This policy requires programs for drought monitoring, assessment, preparedness, mitigation, and assistance.

The state must consider the needs of all water users during drought, including dryland and irrigated agriculture; municipal and rural water suppliers; energy producers; mining and mineral processing, forest products, tourism, and recreation-based businesses; and individual water users. Incentives should be provided for all water users to act to prevent or reduce the effects of drought. State technical and financial assistance should be provided to water users in a consistent and predictable manner. Water users should consider the risks posed by drought when making major management decisions and should know what to expect from government if drought occurs.

ISSUES, OPTIONS, AND RECOMMENDATIONS

Eight functions are identified as necessary for accomplishing the state's proactive drought management policy. The issues are how to accomplish these eight functions.

Issue 1 - Drought Monitoring and Early Warning

Drought monitoring means collecting data, analyzing it, and reporting on the probability and severity of drought. Several government agencies and a few private entities are involved. Current monitoring efforts can be improved to provide better early warning of drought conditions.

One useful tool for monitoring drought is the Palmer Drought Index (PDI). The PDI is valuable as a measure of soil moisture and its availability to meet the needs of dryland crops and rangeland forage. The PDI is calculated weekly by the National Weather Service for seven broad regions of Montana. These regions are so large that some locally severe drought conditions go unreported. Also, the PDI is not a good predictor of streamflows, particularly in mountainous regions where runoff depends primarily on snowmelt. An alternative index, known as the Surface Water Supply Index (SWSI), is being developed to forecast streamflow conditions in such areas. In Montana, both the PDI and SWSI may be used for drought early warning and monitoring. The SWSI is applicable to water users dependent on streamflows, and the PDI is applicable to dryland agriculture.

Questions arise as to how monitoring information should be compiled and made accessible. Who should be responsible? Should monitoring efforts be intensified as drought conditions appear likely?

Options

1. Improve monitoring of soil moisture.
2. Pursue the calculation of the PDI for smaller geographical areas.
3. Encourage the continued development and revision of basin-specific SWSIs.
4. Improve coordination in the collection, interpretation, and reporting of the PDI, SWSI, and other drought forecasting and monitoring information. This information must be passed on to people in time for them to make decisions to reduce their vulnerability to drought.

Recommendations

Options 2, 3, and 4 are recommended. Option 1 was considered desirable, but rejected on the basis of potential manpower and cost-related problems.

Issue 2 - Impact Assessment

Drought impacts are assessed by using the monitoring information to predict economic, environmental, and social costs. Assessments may be prepared on the drought-related impacts to: (1) specific crops and livestock, (2) tourism, (3) energy production, (4) domestic water supplies, (5) wildfire, and (6) fish and wildlife.

Options

1. Support research applicable to specific Montana locations on the relevance of water availability to crop

and livestock production, tourism, energy production, the quality of domestic water supplies, wildfire potential, and fish and wildlife production.

2. Develop economic models that can compare the value of water for various uses in the economies of specific areas in Montana.
3. Coordinate the efficient and timely assessment of impacts related to various water uses. A list of the individuals with the expertise to assess impacts should be maintained.

Recommendation

Option 3 is recommended. While basic research is strongly supported, Option 1 was rejected as being too vague to be implemented. The economic information derived under Option 2 would also be useful, but this option was rejected to avoid creating the false impression that the state is interested in reallocating water based on economic values.

Issue 3 - Coordination of Governmental Actions

Coordination is essential to properly administer programs for drought monitoring, impact assessment, assistance, education, and mitigation. Presently, the vehicle for drought management coordination is the 1985 Montana Drought Plan. This plan designates the Disaster Advisory Council as responsible for providing coordination. However, the plan and the Disaster Advisory Council are only activated after a drought situation emerges. This is contrary to the proposed proactive drought policy. Further, the coordination provided by the plan is vague with respect to drought monitoring, management decision making, assistance, education, and mitigation. There is little knowledge of, or adherence to, the plan by most other drought-affected government agencies or the general public.

Options

1. Replace the current drought plan, by directive of the governor, with a document that incorporates the recommendations of the state water plan.
2. Expand the Disaster Advisory Council to include federal, local government, and private representation.
3. Create a permanent Drought Monitoring Committee responsible for forecasting drought conditions. This committee would advise the governor of the need to activate the Disaster Advisory Council. The Drought Monitoring Committee would have authority to:

- a. review and report drought monitoring information.
 - b. identify those areas of the state with a high probability of drought and target reporting and assistance efforts to those areas.
 - c. upon request, appoint and organize local drought advisory committees for those areas. Committee membership should be comprised of state and local government officials, including conservation districts; and local water user groups, including agriculture, recreation and tourism businesses, and other economic interests important in that area.
 - d. assign state agency staff to provide technical assistance to local drought advisory committees.
4. Provide specific criteria for activation of the Disaster Advisory Council, other than a governor's directive.
 5. Reassign responsibility for state drought management coordination from the Disaster Advisory Council to a permanent Drought Advisory Council. The Drought Advisory Council would be chaired by a representative of the Governor's Office and representatives of each of the other agencies previously represented on the Disaster Advisory Council, though not necessarily the directors of those agencies. Non-voting representatives of federal and local governments and public and private interest groups should also be appointed. The Drought Advisory Council would have authority to:
 - a. review and report drought monitoring information.
 - b. identify those areas of the state with a high probability of drought and target reporting and assistance efforts to those areas.
 - c. upon request, appoint and organize local drought advisory committees for those areas. Committee membership should be comprised of state and local government officials, including conservation districts; and local water user groups, including agriculture, recreation and tourism businesses, and other economic interests important in that area.
 - d. request state agency staff to provide technical assistance to local drought advisory committees.

Recommendations

Options 1 and 5 are recommended.

Issue 4 - Triggering Mechanisms

The current drought plan uses the Palmer Drought Index to trigger certain drought response activities. With the development of the Surface Water Supply Index, an additional criterion becomes available that is more applicable to surface water users. These criteria may be used to gauge the propriety of certain drought management activities against the severity of the drought conditions.

Triggering mechanisms serve as guides for state action. They are not intended to replace existing procedures based on local conditions and requests. For example, the issue of when to declare a disaster, and when to declare the disaster over, can be controversial. Some recreation-based businesses may oppose the designation, while some farmers and ranchers may want it in order to take advantage of federal assistance programs. This kind of conflict is best dealt with at the local level, with the triggering mechanisms merely serving as guidelines to help in making such decisions.

Options

1. To insure that drought-response efforts correspond to the magnitude of specific drought conditions, the drought plan should recommend specific actions corresponding to numerical indicators of drought severity. Actions should be linked to numerical thresholds as drought conditions both intensify and recede.
2. Both the PDI and the SWSI should be used as triggering mechanisms. The PDI should be used to indicate drought severity to dryland agriculture, and the SWSI to forecast and measure the severity of drought for surface water users. Other drought monitoring information should also be considered. If this information indicates that the PDI or the SWSI are not accurate indicators of drought severity, actions should be taken earlier or later than the triggering mechanisms would suggest.

Recommendations

Both options are recommended.

Issue 5 - Assistance Programs

Assistance programs are programs available immediately prior to, during, and after a drought. Some of these programs are reactive, rather than preventive, in nature. Federal assistance programs are primarily geared to providing financial assistance, while state assistance programs

generally provide technical assistance. The federal government administers the crop insurance program, which allows farmers to protect themselves financially against drought losses. Other federal programs are activated when a disaster is declared by the president or the chief executive officer of the responsible federal agency. Although the majority of these programs are geared to agricultural users, there are a limited number of programs for other types of assistance needs.

Options

1. Expand the types of technical and financial assistance provided to all victims of drought, filling the gaps left by federal financial assistance programs.
2. Update the list of available state and federal assistance programs in the state drought plan.
3. Provide technical and financial assistance to local drought advisory committees for promoting local drought preparedness.
4. Oppose elimination of the federal crop insurance program, and support changes in this program that will make it more efficient and attractive to producers.

Recommendations

Options 2,3, and 4 are recommended. Option 1 was rejected as being too vague and politically impractical.

Issue 6 - Funding for Drought Management Programs

Drought monitoring, assessment, education, mitigation, and assistance all cost money. The issue is how to pay for improved state drought management. Some improvement in drought management programs may be possible by reallocating and better utilizing existing resources. Significant improvements are unlikely without additional funds.

Options

1. Reallocate and better utilize existing staff and operating budgets.
2. Apply for grant funding from the Montana Water Development Program, Renewable Resource Development Program, or other state or federal sources for a pilot drought management program.
3. Seek a direct legislative appropriation of funds.

Recommendations

Option 2 is recommended. Option 1 is recommended as a fallback position if grant funding does not materialize.

Option 3 was rejected as unrealistic in light of the state's current budget problems.

Issue 7 - Research and Educational Programs

Many educational opportunities are available on how to prepare for drought through the Cooperative Extension Service, the Soil Conservation Service, the Bureau of Reclamation, local conservation districts, and other agencies. Some people may not know this information exists. A water education program was just recently established at the Water Resources Research Center in Bozeman. This program will provide information to adults and also develop a training program and curriculum for school teachers to teach Montana's children about water resources and its management.

Research is ongoing in a number of areas to find ways to reduce drought impacts, particularly those suffered by agriculture. One example is research to develop more drought resistant varieties of crops.

Options

1. Encourage the use of existing water educational programs, including those of the Extension Service, Soil Conservation Service, conservation districts, and the water education program being developed at the Water Resources Research Center.
2. Support ongoing research into ways to improve drought monitoring, assessment, and mitigation.
3. Publish and distribute a comprehensive annotated directory of available educational resources about water conservation.
4. Better utilize the media and other means of communication for informing the public about drought management options and activities.

Recommendations

All of the options are recommended.

Issue 8 - Drought Mitigation Strategies

Drought mitigation strategies are potential options or improvements to ongoing water management activities that would, over the long term, reduce the adverse effects of drought.

Options

1. Amend the law to allow emergency water right transfers with expedited state review.
2. Allow utilities to invoke temporary water rate hikes to encourage emergency water conservation measures.

3. Use weather modification technology where it is feasible.
4. Increase the emphasis given to the watershed-related aspects of forest and range management, managing plant and tree ground-cover to retain soil moisture rather than increasing runoff.
5. Provide county governments, conservation districts, or water conservancy districts the emergency authority to implement and enforce local drought plans.
6. Inventory and review operating plans of all existing reservoirs in water-short basins to encourage reservoir operators to adequately consider drought contingencies.
7. Inventory and review the operating plans of state-funded reservoirs to insure that these plans address drought contingencies. Where no operating plans exist for these reservoirs, such plans should be developed and implemented. Also, these reservoirs should be rehabilitated to operate at design capacity and improve the state's capabilities to respond to drought consistent with State Water Plan recommendations for the rehabilitation of water storage projects.
8. Establish stronger economic and other incentives for private investments in water conservation.
9. Consider feasible water storage where it will increase water supply security.
10. Consider basin closure by petition of local water users, as provided by law, to preclude over-appropriation and further aggravation of water shortage situations.
11. Encourage voluntary water conservation by domestic, municipal, and industrial water users.
12. Clarify state law so that water right holders who conserve water are clearly allowed to sell or lease the salvaged water in a manner that does not adversely affect existing water users.
13. Improve water use and conveyance efficiencies in agricultural, municipal, and industrial systems where such improvements will not adversely affect ground-water supplies or return flows needed by other water users.
14. Clarify state law to clearly allow the voluntary, temporary changes of private water rights and contract water exchanges. Such changes could reallocate water to highly valued offstream and instream water uses, whose users anticipate water short years. Such reallocations would be regulated by the state to insure the protection of other potentially affected water users and would have to be planned well in advance of the anticipated dry years.

15. Urge the Board of Natural Resources and Conservation to adopt rules where the installation of water measuring devices will significantly help to resolve conflict and improve the distribution of water during drought in water-short drainages.
16. Find ways to expedite the resolution of local water use conflicts and water rights enforcement during drought before the general adjudication process is completed.
17. Develop a model water conservation ordinance or contract clause for adoption by municipalities and rural domestic water suppliers.
18. Adopt a section of the State Water Plan devoted to the appointment and operation of permanent basin advisory committees. These committees should serve as forums for discussing any local water-related problems and management issues, including drought.

Recommendations

Options 6 through 18 are recommended. Option 1 was rejected because the committee felt there was no way to expedite the water right change process without compromising the protection of other water right holders. Options 2 and 5 were rejected because these authorities already exist. Options 3 and 4 were not believed to be viable drought management tools at this time.

PLAN IMPLEMENTATION

Legislative Action

First, the legislature needs to transfer the disaster planning responsibility for drought from the Department of Military Affairs to a Drought Advisory Council. Second, the legislature needs to clarify that the water rights change statute allows voluntary, temporary water right changes that would not adversely affect other water users. Third, the legislature needs to clarify that water right holders who salvage water through conservation retain the right to sell or lease that water.

Administrative Action

Calculating the Palmer Drought Index for smaller geographical areas should be the responsibility of the State Climate Center at Montana State University. The Soil Conservation Service should continue to develop and refine the Surface Water Supply Index. Coordination in reporting drought monitoring information should be the responsibility of the Department of Natural Resources and Conservation (DNRC), in cooperation with the Montana Water Information System in the State Library. The

DNRC would report drought information using computer generated maps prepared by the Montana Water Information System. The reporting effort should make better use of the media and other available means of communication, such as computer bulletin boards.

Once authorized by the governor and the legislature, the Drought Advisory Council should oversee the development of a new Montana Drought Plan. The new Montana Drought Plan should list individuals with the technical expertise and responsibility to perform drought impact assessments, upon request of the Drought Advisory Council. This plan should also provide an updated list of state and federal assistance programs and identify the specific triggering mechanisms used to guide drought management actions.

Once a high probability of drought is indicated, the Drought Advisory Council should consult with the local officials in the drought prone area and offer to provide state assistance to a local drought advisory committee. Local drought advisory committees also may be created in normal years where sufficient interest exists. Figure 1 depicts the relationship between the State Drought Advisory Council and local drought advisory committees. The DNRC would staff the State Drought Advisory Council and provide technical assistance to local drought advisory committees. The state council is not intended to have any authority over the local committees. This relationship is necessary merely to ensure coordination between the state and local levels. Existing organizational relationships between state government and local officials (such as the relationship between the DNRC and local conservation districts) should be used to the extent possible to ensure

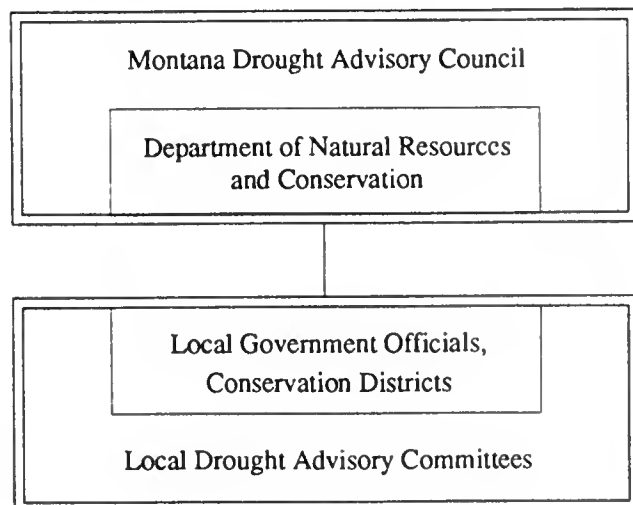
efficient coordination. Local entities, such as conservation districts, should be encouraged to apply for state financial and technical assistance to develop local drought plans at any time.

The publication of an annotated directory of available educational resources about water conservation should be the responsibility of the new water education program at the Water Resources Research Center in Bozeman. This program should also promote voluntary water conservation as part of its general educational charge and encourage the use of water education resources in the state.

The Board of Natural Resources and Conservation is urged to adopt rules relating to water measuring devices, as necessary to resolve conflict and improve distribution of water during drought. Similarly, the State Water Plan Advisory Council should actively solicit the development of a state water plan section on basinwide, or local level, water resources planning. The way in which water storage will be considered for improving water supply security should be determined in the state water plan. The cooperation and assistance of the state Water Court and local district courts should be sought to find ways to expedite the resolution of local water right conflicts during drought.

The responsibility falls to the Drought Advisory Council, with DNRC staff, to implement all of the other recommendations in this plan section, although other entities will certainly play an important part. These recommendations include suggesting basin closure as an option for local water users, seeking more efficient water use and conveyance by large water users, inventorying and reviewing reservoir operating plans, opposing elimination of the Federal Crop Insurance Program, and developing a model water conservation ordinance for adoption by municipalities and rural domestic water suppliers.

Figure 1.
Organization for Proactive Drought Management



Financial Requirements and Funding Strategies

A grant is requested from the Water Development Program to establish a pilot drought management program. This grant will be a cooperative endeavor involving the State Climate Office, the State Library, the Water Center at Montana State University, and the DNRC. The grant would provide staff and an operational budget to initiate implementation of the recommendations of this plan section.

A priority use of the grant would be to test the proactive, locally-focused drought management approach if a drought arises during the time when grant resources are available. If no drought develops, the funds will be used to lay the foundation for the use of this management approach

when the occasion arises. This foundation includes the production of the new Montana Drought Plan, the establishment of the improved monitoring and early warning system, and the development of educational efforts and various mitigation strategies.

The reallocation of DNRC staff resources and operating expenses is recommended as a fallback method of funding some of the recommendations in this plan section if grant funds are not awarded. The efficient use of existing financial resources, and any available grant funding, is essential to implement this plan section.

Plan Implementation Summary

<u>Action</u>	<u>Responsibility</u>	<u>Deadline</u>
Issue 1-Drought Monitoring		
Calculate PDI for smaller regions	State Climate Center	January, 1992
Develop SWSI	Soil Conservation Service (SCS)	January, 1992
Improve monitoring coordination	DNRC, State Library	January, 1992
Issue 2-Impact Assessment		
Coordinate timely impact assessments	Drought Advisory Council	As Needed
Issue 3-Coordination of Government Actions		
Replace State Drought Plan	Governor, Drought Advisory Council	August, 1991
Reassign drought management responsibility to Drought Advisory Council	Legislature	April, 1991
Issue 4-Triggering Mechanisms		
Include triggering mechanisms in new drought plan	Drought Advisory Council	August, 1991
Issue 5-Assistance Programs		
Update list of assistance programs	Drought Advisory Council	August, 1991
Assist local drought advisory committees	All State and Federal Agencies	As Needed
Issue 6-Funding Drought Management Programs		
Obtain grant funding	Legislature	July, 1991
Issue 7-Research and Education Programs		
Encourage the use of existing programs	MSU Water Center, SCS, Extension Service, Conservation Districts, DNRC	Ongoing
Support ongoing research	Montana University System	Ongoing
Publish directory of water conservation information	MSU Water Center	January, 1992
Develop public information strategy	Drought Advisory Council	August, 1991
Issue 8-Drought Mitigation Strategies		
Inventory reservoir operating plans	Drought Advisory Council, DNRC	July, 1992
Consider water storage and basin closure	Drought Advisory Council, DNRC	Ongoing
Encourage water conservation	Drought Advisory Council, DNRC	Ongoing
Clarify that state law allows sale or lease of salvaged water	Legislature	April, 1991
Clarify that state law allows voluntary, temporary water right transfers	Legislature	April, 1991
Consider adoption of water measurement rules	Board of Natural Resources and Conservation	October, 1992
Expedite water rights conflict resolution and enforcement	Water and district courts, Drought Advisory Council, DNRC	Ongoing
Develop a model water conservation ordinance	Drought Advisory Council, DNRC	August, 1991
Adopt a state water plan section on basin planning	DNRC	December, 1990

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INTRODUCTION

In this plan section, the term "water storage projects" includes the construction of new storage projects and the rehabilitation and expansion of existing facilities. The term also encompasses all three types of storage. Onstream storage refers to facilities that are located on a stream or river and impound only the natural flow of that stream or river. Onstream storage may be located on either mainstem rivers or tributary streams. Offstream storage refers to facilities where the primary water supply is diverted from another water course or storage facility. Finally, nonstructural storage refers to any nonstructural or management activity that affects the timing and flow of water in a natural water course (e.g., groundwater recharge, wetlands enhancement, and watershed management).

Historically, water storage projects have provided a variety of benefits to the state of Montana. Reservoirs store water for irrigation, municipal, industrial, and stockwater consumption; provide opportunities for flatwater fishing and boating and improve riparian habitat; supply water for hydropower generation; and regulate streamflows for irrigation, flood control, hydropower, water quality, and fishery purposes. In many cases, storage projects have improved fisheries and recreational opportunities.

The first storage projects in Montana were built to supply water for mining operations. The homesteaders who followed relied upon small irrigation projects for agricultural development in Montana's semi-arid climate. As the state's population grew, so did the size, number, and variety of reasons for constructing water storage projects. By the 1980s, the Soil Conservation Service, the Bureau of Reclamation, the U.S. Army Corps of Engineers, and the Agriculture Stabilization and Conservation Service had combined with state and private entities to develop an estimated 11,000 reservoirs in Montana. Of these, 67 reservoirs store over 5,000 acre-feet of water, while two-thirds of the reservoirs are primarily for stockwater and hold less than 50 acre-feet.

The largest water storage projects (Fort Peck, Canyon Ferry, Hungry Horse, Yellowtail, Libby, and Tiber dams) were built by the federal government. These storage facilities are used for multiple purposes, including irrigation, flood control, hydropower production, and by recreationists who take advantage of the opportunity to swim, boat, fish, and water ski. The state owns several storage projects that were constructed in the 1930s and 1940s with financial assistance from the federal Public Works Administration. Other large dams are single-purpose hydropower facilities owned by private utilities such as the Montana Power Company. A few reservoirs larger than 5,000 acre-feet were built by private groups for irrigation purposes.

It is clear that water storage has and will continue to solve many water resource problems in Montana. However, its applicability is limited by several factors, including the availability of water, technical feasibility, environmental impacts, and funding.

The planning, construction, operation, maintenance, and rehabilitation of water storage facilities is expensive. Water storage projects must often compete for scarce federal and state funds, and their priority must be determined in light of other water management activities.

THE ROLE OF STORAGE IN WATER MANAGEMENT

Montana's water management problems are diverse and vary according to site-specific conditions. No single water management tool (e.g., water storage, water use efficiency, or water right transfers) can effectively and efficiently solve all water management problems. The best water management tool for a particular problem is usually selected through a problem-solving process similar to the following (*presented here for public review and comment*):

1. Define the problem. The water management problem must be adequately and appropriately defined by water users (including municipal, agricultural, recreational, and other appropriate users) and technical experts.
2. Identify all the options to solve the problem, including water storage. Potential water storage projects, both new and existing, could be identified: (1) by working with appropriate government agencies and water user groups to review, evaluate, and update existing lists of potential storage projects; and (2) during the process of developing basin-specific plans.
3. Determine whether water is physically and legally available. Existing water rights must not be adversely affected by the water management tool(s) being considered to solve a problem.
4. Select the option that best meets the following criteria:
 - a. Technical feasibility -- Does it solve the problem from a technical perspective?
 - b. Financial feasibility -- Do the sponsors have the ability to obtain financing and repay any capital investments as well as the associated operation, maintenance, and rehabilitation expenses?
 - c. Economic feasibility -- Do the direct and indirect benefits, both quantifiable and nonquantifi-

able, exceed the direct and indirect costs, both quantifiable and nonquantifiable?

- d. Political feasibility -- Is it supported by water users, including municipal, agricultural, recreational, and other affected water users?
- e. Legal feasibility -- Can all applicable federal, state, local, and other legal requirements be satisfied?
- f. Environmental feasibility -- Does it protect and seek to enhance social, cultural, and ecological values?

Through this problem-solving process, a water storage project could emerge as the best solution to a particular water resource problem. Where that happens, this plan section is designed to facilitate the development of the needed facilities.

This section of the state water plan is divided into three subsections. The first subsection describes how the state should set priorities among water storage projects, allocate state funds among those projects, and ensure that action is taken to complete water storage projects. The second subsection focuses on the financing of water storage projects, while the third subsection addresses the regulatory aspect of developing and rehabilitating water storage projects.

SUBSECTION 1: WATER STORAGE POLICY

BACKGROUND

State water storage policy is to some extent already defined by Montana law. Section 85-1-101(2), MCA declares that *"the public policy of the state is to promote the conservation, development, and beneficial use of the state's water resources to secure maximum economic and social prosperity for its citizens."* Section 85-1-101(4), MCA goes on to say that *"the development and utilization of water resources and efficient, economic distribution thereof are vital to the people in order to protect existing uses and to assure adequate future supplies for domestic, industrial, agricultural, and other beneficial uses."* Finally, Section 85-1-101(6), MCA notes that *"the public interest requires the construction, operation, and maintenance of a system of works for the conservation, development, storage, distribution, and utilization of water, which construction, operation, and maintenance is a single object and is in all respects for the welfare and benefit of the people of the state."*

Although these declarations of policy illustrate the importance of water development and storage to the state of Montana, they do not provide much guidance for selecting which water storage projects to pursue in light of limited state resources. Nor do they ensure that specific actions will be taken by state government to develop priority water storage projects, especially in light of other water management activities.

POLICY STATEMENT

Water storage (including the construction of new projects and the rehabilitation and expansion of existing projects) shall be considered equally with all other practical options in any search for solutions to water resource problems. When the water storage option is determined to be the water management tool that best solves the problem and promotes and enhances the general welfare of the people of Montana, then it should be actively pursued. The pursuit of water storage projects requires a strong and focused commitment by the state. Given the limited resources of the state, priorities must be established among water storage projects in order for the state to be able to make a commitment to the most important water storage projects.

ISSUES, OPTIONS, AND RECOMMENDATIONS

Issue 1 — Prioritizing New Projects

When new water storage projects are selected as the best way to resolve a particular water resource problem, the state faces the question of which projects to focus its limited resources upon. The following options present possible criteria for resolving that question. These criteria are not in any order of priority, recognizing that some may be more important than others on a site-specific basis.

Options

1. Solve the most severe problems.
2. Provide multiple uses and benefits.
3. Provide for public uses.
4. Show strong evidence of broad citizen support.
5. Have the ability to obtain non-state sources of funding.
6. Protect and seek to enhance social, ecological, cultural, and aesthetic values.
7. Improve local and state economic development.
8. Help resolve Indian and federal reserved water rights.
9. Support water conservation activities.
10. Promote the use of water reserved under Montana law.

Recommendation

The priority of new water storage projects should be established according to which projects best satisfy options 1 through 10, realizing that some of the criteria may not apply in some cases.

Issue 2 — Prioritizing Rehabilitation Projects

Several existing water storage projects in Montana are seriously in need of rehabilitation. The rehabilitation of existing projects may also help solve a variety of other water management problems, because projects may be expanded and improved during rehabilitation efforts. However, it

may be difficult to rehabilitate all existing dams due to the cost of such activities.

The estimated cost for rehabilitating several existing water storage facilities in Montana ranges from under \$200,000 to over \$5 million per site. Rehabilitating the Tongue River Dam alone will cost between \$25 million to over \$125 million, depending on the amount of risk to life and property the state and its citizens are willing to assume. The total cost for rehabilitating approximately 35 state-owned high-hazard dams, including the Tongue River Dam, is expected to exceed \$200 million.

In light of the need to rehabilitate existing water storage projects, and the cost of such efforts, the state needs to decide which facilities should be rehabilitated first. One factor affecting the effort to prioritize such projects is the Montana Dam Safety Act. This act defines a "high-hazard" dam as any dam or reservoir that, if it fails, would likely cause a loss of life. The classification of a dam as high-hazard, however, does not determine nor imply whether the dam is structurally safe. Thus, the safety of a particular dam, in addition to its classification as high hazard, must be considered in any scheme to prioritize the rehabilitation of existing water storage projects.

Options

1. Identify the high-hazard projects most needing repair based on the criteria listed under The Role of Storage in Water Management, those listed in Issue 1, and the following criteria:
 - a. Protect public safety
 - b. Impacts of not repairing project
2. Breach high-hazard dams that cannot be repaired with a positive benefit-to-cost ratio.
3. Rehabilitate all unsafe high-hazard dams by the year 2000.

Recommendations

Option 1. The priority of rehabilitation projects should be established according to which projects best satisfy the criteria outlined in Option 1, realizing that some of the criteria may not apply in some cases.

Issue 3 — Allocating State Funds

As mentioned above, water storage projects must compete with other water management activities in terms of state and federal assistance. In addition, water storage

projects must compete among each other for limited state and federal financial and technical resources. Although the state has a limited ability to determine how federal resources are allocated, it can set priorities for allocating state funds. The question is, given the amount of state funding available for water storage projects, how should these funds be allocated? A related question, how to increase the amount of state funding available for water storage projects, is addressed in the next subsection on financing water storage projects.

Options

1. Allocate the state funds available for water storage solely to rehabilitate existing water storage projects, particularly unsafe, high-hazard facilities.
2. Allocate the state funds available for water storage solely to plan and construct new water storage facilities.
3. Allocate a certain percentage of the state funds available for water storage for onstream, offstream, and nonstructural types of storage.
4. Allocate the state funds available for water storage based on the following order of preference:
 - a. Resolve threats to life and property posed by high-hazard facilities that are in an unsafe condition.
 - b. Improve and/or expand existing water storage facilities.
 - c. Plan and construct new water storage facilities.

Recommendation

Option 4. This approach recognizes the importance of rehabilitating unsafe, high-hazard dams, but also allows for other water storage activities.

PLAN IMPLEMENTATION

Legislative Action

The legislature needs to enact legislation that explains the role of storage in water management, including the generic problem-solving process outlined above. The legislature also needs to enact legislation outlining the criteria for prioritizing new storage projects and rehabilitation projects. The legislation should specify that the Governor's Office, in cooperation with the legislature, will have final authority for prioritizing all water storage projects.

The legislature also needs to enact legislation specifying that state funds available for water storage should be allocated according to the preferences described above.

Administrative Action

The Department of Natural Resources and Conservation needs to prepare a progress report on water storage activities and submit it to each general session of the legislature. The report should include, at a minimum: (1) the list of water storage project priorities as determined by the governor and the legislature; (2) an implementation strategy for

each priority project that identifies the resources, government actions, and political support needed to accomplish the project; and (3) the status of the priority projects.

Financial Requirements and Funding Strategies

The implementation of this subsection does not require any additional funding beyond that needed for the water storage projects themselves.

Plan Implementation Summary

<u>Activity</u>	<u>Responsibility</u>	<u>Deadline</u>
General		
Enact legislation that explains (1) the role of water storage in water management; and (2) the generic water resources problem-solving process	Legislature	April, 1991
Develop a report on water storage activities each biennium	DNRC	Ongoing
Issue 1 - Prioritizing New Projects		
Enact legislation outlining the criteria for prioritizing new water storage projects	Legislature	April, 1991
Prioritize new storage projects	Governor and legislature	Ongoing
Issue 2 - Prioritizing Rehabilitation Projects		
Enact legislation outlining the criteria for prioritizing the rehabilitation of existing water storage projects	Legislature	April, 1991
Prioritize rehabilitation projects	Governor and legislature	Ongoing
Issue 3 - Allocating State Funds		
Enact legislation outlining the preferences for allocating state funds for water storage projects	Legislature	April, 1991

SUBSECTION 2: WATER STORAGE FINANCING

BACKGROUND

The cost of constructing, operating, maintaining, and rehabilitating water storage facilities varies tremendously depending on their size, location, and site-specific geological and hydrological conditions. In light of this variation, the next several paragraphs illustrate the range of costs, in 1988 dollars, for developing, maintaining, and rehabilitating water storage projects (see Table 1).

The construction costs of existing water storage projects in Montana (excluding small stockwater and fish ponds) ranges from approximately \$50,000 (for Sturgis Dam) to \$258 million (for Yellowtail Dam). The construction costs of the majority of existing water storage facilities falls in the range of approximately \$1 million to \$4.5 million. The cost per acre-foot (based on total storage capacity) ranges from about \$45 (at Canyon Ferry) to \$2,400 (at Pike Creek Dam).

The annual cost for operating and maintaining existing water storage facilities ranges from about one-half to one and one-half percent of the total cost of construction on an annual basis. Rehabilitating and replacing water storage facilities are also expensive. The estimated cost for rehabilitating existing water storage facilities in Montana was outlined in Subsection 1, Issue 2. While historically there have been inadequate funds available for operating and maintaining some water storage facilities, funds are generally unavailable to rehabilitate and replace nearly all water storage facilities.

Finally, the estimated cost of constructing reasonably large new water storage facilities in Montana ranges from nearly \$10 million for the Johnson Creek site (with a firm annual yield of 5,000 acre-feet) to over \$215 million for the Sunday Creek site (with a firm annual yield of 215,600 acre-feet). The annual cost per acre-foot of yield (based on firm annual yield) ranges from \$38 at the Reichle Dam site (with a firm annual yield of 140,000 acre-feet) to \$378 at the Buffalo Creek site (with a firm annual yield of 27,480 acre-feet).

The estimated cost of constructing several much smaller new water storage facilities (ranging in size from approximately 5,000 acre-feet to 25,000 acre-feet) falls in a range of \$1 to \$10 million. The annual cost per acre-foot for these smaller facilities falls into a range of \$100 to \$1,000, with most of them being around \$500. The annual cost per acre-foot for a few water storage facilities, however, has been estimated at less than \$100.

Historically, federal and state governments helped initiate the development of water storage facilities by providing the necessary up-front funds for project planning and construction. Beneficiaries of the completed water storage projects then repaid, in the form of user fees, some or all of the costs attributable to such benefits (i.e., agriculture has generally repaid 10 to 100 percent on specific projects, while hydropower has generally paid 100 percent). Although many water storage projects provide fish, wildlife, recreation, and other environmental benefits, as well as flood control and navigation benefits, these direct beneficiaries have had to pay little of the cost of these benefits

Table 1. Costs of Water Storage Projects

<i>Existing Projects</i>				
<u>Construction</u>	<u>Cost/Acre-foot (total storage capacity)</u>	<u>Operation & Maintenance</u>	<u>Rehabilitation</u>	<u>Rehabilitation of 35 State-owned Projects*</u>
\$50,000 to \$258 million	\$45 to \$2,400	one-half of 1% of construction	\$200,000 to \$125 million	\$200 million
<i>New Projects</i>				
<u>Construction of Large Projects</u>	<u>Cost/Acre-foot of Large Projects (firm annual yield)</u>	<u>Construction of Smaller Projects</u>	<u>Cost/Acre-foot of Smaller Projects (firm annual yield)</u>	
\$10 to \$215 million	\$38 to \$378	\$1 to \$10 million	\$100 to \$1,000	

* This total includes \$125 million for one project, the Tongue River Dam.

(e.g., existing recreational user fees generally do not help pay for the costs of water storage facilities). Rather, these benefits have been paid for largely by the general taxpayer.

Although the federal government's interest in financing water storage projects has recently waned, there are still several funding and technical assistance programs administered by federal agencies such as the Soil Conservation Service's watershed management program and the Bureau of Reclamation's technical assistance program. In addition, the state of Montana administers several programs for funding water management activities, including water storage projects.

POLICY STATEMENT

Financing water storage is an important aspect of water development in Montana. The State of Montana should focus resources on understanding, coordinating, and improving funding programs for water storage development, operation, maintenance, and rehabilitation. Although specific financing packages must be developed on a site-specific basis, all beneficiaries should be considered for a responsible role in repaying the cost of water storage projects. The financial costs of operating and maintaining water storage facilities should be assured prior to construction, and the costs of rehabilitation and replacement should also be considered.

ISSUES, OPTIONS, AND RECOMMENDATIONS

Issue 1 - Information, Education, and Assistance

Although there are a variety of federal, state, local, private, and other sources of funding for water storage projects, it is currently very difficult to find one person or organization that understands all of the programs. As a result, potential project sponsors are unaware of and do not understand the conditions under which financing is available in the various programs.

Options

1. Document existing programs. Creating and updating a directory may facilitate the financing of water storage projects.
2. Provide public information and education on the availability of programs for financing new and existing water storage projects, in addition to the

costs and benefits of water storage projects. This campaign would specify what funds are available and under what conditions.

3. Create a committee of diverse interests to facilitate efforts to finance water storage projects. This committee could serve as a clearinghouse for (1) providing public information and education, (2) developing financial packages for funding water storage projects, and (3) coordinating permitting and regulatory issues related to water storage development. This committee might be coordinated and staffed by the Department of Natural Resources and Conservation (DNRC), the Montana Water Resources Association, the Environmental Quality Council, the Water Resources Research Center, or some other organization.
4. Designate a person (in the Department of Natural Resources and Conservation, the Montana Water Resources Association, the Environmental Quality Council, or the Water Resources Research Center) as a "water storage development coordinator" to facilitate efforts to develop water storage projects. This person would serve in the same capacity as the committee described above.

Recommendation

Options 1 and 4. These options are likely to have the greatest impact on financing water storage projects. However, the options that were not selected may also be desirable or feasible.

Issue 2 - State Water Resource Funding Programs

The Department of Natural Resources and Conservation administers several grant and loan programs for a variety of water management activities, including water storage. One is the Water Development Program (WDP). According to Montana law, "*the water development program is the key implementation portion of the state water plan and shall be administered to accomplish the objectives of the plan*" (Section 85-1-602, MCA). It goes on to say that "*The storage of water for existing and future beneficial uses shall be given the highest priority [for funding] unless a water development project or activity designed to accomplish another objective is demonstrated to be more beneficial to a greater number of people*" (Section 85-1-602, MCA).

A second program is the Renewable Resource Development (RRD) Program. This program provides grants for

the development of all types of renewable resources, including water. A third program is the Reclamation and Development Grant (RDG) Program. This program is designed to fund projects that mitigate the impacts of mining or meet other "crucial state needs." It is conceivable that water storage could be considered part of a reclamation program under the "crucial state need" category, but most water storage projects probably fit better under the Water Development Program or the Renewable Resource Development Program. The principle source of funding for each of these programs are taxes on the extraction of non-renewable resources.

The majority of funds potentially available under these funding programs are not allocated to water storage projects for two primary reasons. First, the Montana Legislature has diverted a significant amount of the funds originally intended for these programs to other, ongoing state programs, primarily the administration of state agencies (see Table 2). Since 1984, over \$41 million dollars was deposited in the accounts created for the WDP and RRD programs. However, only about \$19 million was allocated as grants. The trend has been that more and more of the funds deposited in the accounts are being used for other programs, and, consequently, less are available for water projects.

Second, there has been a lack of applications for water storage projects, and, consequently, available funds are allocated to other types of water projects (see Table 3). Of the slightly more than \$19 million that has actually been

Table 2. Allocation of Funds Authorized for the WDP, RRD, and RDG Programs

	<u>FYs 1984-91</u>	<u>FYs 1990/91</u>
Authorized	\$41 million	\$15.7 million
Allocated as Grants	\$19 million	\$4.6 million
Used to Fund State Agencies	\$22 million	\$8 million
Used to Fund Water Storage*	\$405,000	\$93,000

* These amounts are included in funds allocated as grants

available for grants, a total of only about \$400,000 has been used to fund water storage projects. Since the inception of the programs in 1984, a total of 32 applications have been received for loans and grants to fund water storage projects. Twenty-nine of these applications have been completely funded. Under the Water Development Program, six water storage projects have been granted about \$350,000. By contrast, 70 other projects, including municipal and rural water and sewer systems, streambank stabilization, and groundwater studies, have received about \$4 million.

Table 3. Allocation of Grants and Loans from 1984 to 1991

	<u>Water Storage Projects</u>	<u>Other Projects</u>	<u>Total</u>
Water Development Grant Program	\$350,000 (6 projects)	\$4 million (77 projects)	\$4.4 million (83 projects)
Renewable Resource Development Grant Program	\$55,000 (2 projects)	\$3.7 million (62 projects)	\$3.8 million (64 projects)
Water Development Public Loan Program	\$312,000 (3 projects)	\$22 million (46 projects)	\$22.3 million (49 projects)
Water Development Private Loan Program	\$175,000 (1 project)	\$4.1 million (69 projects)	\$4.3 million (70 projects)
Reclamation and Development Grant Program	0	\$10.8 million	\$10.8 million
Total	\$892,000	\$44.6 million	\$45.6 million

Under the Renewable Resource Development Program, 49 projects have been funded at a total cost of over \$1 million. At the same time, only two water storage projects have been funded under this program at a total cost of about \$55,000.

Under the Water Development Public Loan Program (which is financed by the sale of bonds backed by the coal severance trust fund), three water storage projects have been funded at a total cost of about \$312,000. By contrast, 46 other projects have been funded under this program at a total of over \$22 million.

Under the Water Development Private Loan Program (which is financed in part by RRD funds and the sale of general obligation bonds), 70 loans have been approved for a total of \$4.3 million, including one irrigation storage project at a cost of about \$175,000. Approximately \$5.5 million is available each biennium under the Reclamation and Development Grants Program, but to date no water storage projects have been funded.

The issue on financing in the previous section of this plan focused on how to allocate the funds available for water storage. The purpose of this issue is to explore opportunities for increasing the available amount of such funds.

Options

1. Continue public information and education on the availability of funds under these programs.
2. Encourage potential project sponsors to apply for funds.
3. Support legislative and administrative enforcement of the statutory priority for water storage projects under the Water Development Program.
4. Create a new special revenue account (the "Water Storage Special Revenue Account") to be used exclusively for funding water storage projects. The new account would receive 25 percent of the deposits to each of the Water Development Special Revenue Account and the Renewable Resource Development Account.
5. If the funds deposited in the new "Water Storage Special Revenue Account" are not used during a given biennium, the funds should be allocated to other state programs.
6. If the funds deposited in the new "Water Storage Special Revenue Account" are not used during a

given biennium, the funds should accumulate rather than be transferred to other programs.

7. Seek authorization for allocating a higher percentage of existing non-renewable resource funds (e.g., coal severance tax revenues) to the development of Montana's renewable resources, particularly water.
8. Encourage state government to take a more active role in initiating water storage projects.
9. Authorize the use of 25 percent of the funds over and above the statutory cap of \$100 million on the Resource Indemnity Trust (RIT) Fund for water storage projects that mitigate impacts from industries that have paid the tax.
10. Delete the \$100,000 cap on Water Development Program Grants for water storage projects, as currently outlined in DNRC administrative policy.

Recommendation

Options 4, 6, 7, 9, and 10. These options are likely to have the greatest impact on financing water storage projects. However, the options that were not selected may also be desirable or feasible.

Issue 3 - Cost-sharing and Coordination

When federal funds for water storage development are available, state and local entities are usually required to provide matching funds. However, it is often very difficult for state and local entities to come up with their appropriate share of funds. In view of this situation, the options outlined below are designed to (1) improve the ability to satisfy the cost-sharing requirements; (2) generate funds for operating, maintaining, rehabilitating, and replacing existing storage facilities; and (3) generate funds for constructing projects without federal financial aid.

Options

1. Pursue water storage projects only if they have local and state support and a realistic ability to comply with federal cost-sharing requirements.
2. Creatively utilize all available state, local, and private sources of funding to satisfy federal cost-sharing requirements.
3. Encourage Resource Conservation and Development areas (RC&Ds) to develop funding packages and create broad-based coalitions to support water storage development.

4. Statutorily create water storage districts (similar in concept to irrigation and conservancy districts) that would have the power to tax and collect fees for purposes of funding water storage projects.
5. Establish, on a site-specific basis, special improvement districts, rural improvement districts, conservancy districts, multi-conservation district special project areas, or some combination thereof to help raise funds for water storage projects.
6. Identify potential sources of private sector funding and integrate these on a site-specific basis. These sources might include contributions from various water user groups, such as irrigators, industries, recreationists, conservation and preservation groups, and others.
7. Increase state taxes and designate the additional funds to water storage development.
8. Encourage the state or a coalition of private investors to purchase federally owned water storage projects and operate them to generate funds for operation, maintenance, and new storage projects.

Recommendation

Options 3, 4, and 6. These options are likely to have the greatest impact on financing water storage projects. However, options that were not selected may also be desirable or feasible.

Issue 4 - Payment by Beneficiaries

If water storage projects are to be developed or rehabilitated in the future, a diversity of funding sources will be needed. In addition to using federal, state, and private funds, another possibility is to encourage or require all beneficiaries to play a responsible role in financing the projects. The funds generated from this approach could be used to help finance a portion of water storage projects, including planning, construction, operation, maintenance, rehabilitation, and replacement.

The funds raised under any one of the following options would not generally be relied on to repay the entire cost of a project.

Options

1. Continue having irrigation, hydropower, municipal, and industrial beneficiaries repay some of the project costs through user fees, and allow the sponsor together with the funding source to make site-

specific recommendations on whether those fees will adequately cover the costs of the benefits.

2. Assess the feasibility, via a study, for having recreational beneficiaries repay some of the project costs through user fees. Among the options that might be assessed are:
 - a. A fee, on a site-specific basis, to individuals who take advantage of the recreational benefits associated with water storage projects funded with public resources. Like an entrance fee to a state or national park, the fee would be assessed each time a person participates in some recreational activity related to the water storage project. An annual user's pass would also be available for each site. The funds generated from the fee would be designated for water storage development that includes recreational or fish and wildlife benefits.
 - b. A "water development" stamp. This stamp would be required of anyone purchasing a fishing, duck hunting, boat, or other water-related license. The funds generated from this stamp would be designated for water storage development that includes recreational or fish and wildlife benefits. Such funds would have to be controlled in a manner consistent with state-federal requirements outlined in Section 87-1-701-714, MCA.
 - c. An increase in the Motorboat Fuels Tax to be used for water storage development that includes recreational or fish and wildlife benefits.
 - d. A generic "land and water conservation" license for anyone using public lands or water. At least some of the money generated from these licenses would be designated for water storage development that includes recreational, fish and wildlife, and/or environmental benefits. Such funds would have to be controlled in a manner consistent with state-federal requirements outlined in Section 87-1-701-714, MCA.
3. Continue to use general tax revenues to provide a portion of fish, wildlife, recreational, and other environmental benefits associated with water storage projects.
4. Continue to use general tax revenues to provide flood control and navigation benefits associated with water storage projects.
5. Continue to use general tax revenues to provide a portion of the irrigation, municipal, industrial, and

hydropower benefits associated with water storage projects.

6. Charge individuals and groups that benefit from the flood control and navigation benefits of a new water storage project. Create one of the several resource districts possible under Montana law to collect fees and/or require beneficiaries to pay taxes.
7. Require downstream states to financially compensate Montana for the impacts of upstream reservoirs that largely benefit downstream users.

Recommendation

Options 1, 2a, 2b, 2c, 3, 5 and 6. These options are likely to have the greatest impact on financing water storage projects. However, options that were not selected may also be desirable or feasible.

Issue 5 - Economic Value of Alternative Uses

The appropriate role of each beneficiary in financing water storage projects might be based on the economic value of the benefits received and the ability of the beneficiary to pay. The problem is that, while it is relatively easy to determine the economic value of hydropower, municipal, and agricultural uses of water, it is much more difficult to estimate the economic value of secondary benefits (e.g., local and state economic development) and other direct benefits (e.g., recreation; fish and wildlife protection; wetlands and riparian habitat preservation; augmentation of flows for water quality, instream flow protection, groundwater recharge, and late season irrigation; and downstream navigation).

Options

1. Conduct research designed to identify all the potential benefits associated with water storage projects, estimate the economic value of all these benefits on a per acre-foot basis, assess the validity of methods used to estimate such values, and generate data that can be meaningfully compared (e.g., estimate all the values in terms of acre-feet).
2. Conduct research designed to estimate the value of secondary economic benefits related to water storage development, such as rural and local economic development.

Recommendation

No recommendation. While this is an important issue, it is not a high priority. It could be integrated into the study outlined in Issue 4, Option 2.

PLAN IMPLEMENTATION

Legislative Action

The legislature needs to authorize one new staff position for a "water storage development coordinator" in the Department of Natural Resources and Conservation.

The legislature needs to create a "Water Storage Special Revenue Account" and amend Section 85-1-601 et seq., MCA to allocate 25 percent of the Water Development Special Revenue Account to the new account. Section 90-2-101 et seq., MCA, which deals with the Renewable Resource Development Account, needs to be similarly amended. The legislation should specify that the funds in this account will be used exclusively for water storage projects. In addition, the legislation should specify that, if these dedicated funds are not used during a given biennium, they should accumulate rather than being used to support other programs.

The legislature needs to reallocate more non-renewable resource funds (e.g., coal severance tax revenues) to the development of renewable natural resources, particularly water. The legislature also needs to adopt a provision in Section 85-1-604 and Section 15-38-202, MCA to authorize the use of 25 percent of the funds over and above the statutory cap of \$100 million on the revenue from the Resource Indemnity Trust for water storage projects.

The legislature needs to pass legislation authorizing the creation of local water storage districts that would have the power to tax and collect fees for purposes of funding water storage projects.

Administrative Action

The Department of Natural Resources and Conservation needs to hire (or, in the event that the legislature does not authorize a new position, the DNRC would need to reallocate an existing position for) a water storage development coordinator to document existing federal, state, local, private, and other sources of funding for water storage projects; facilitate efforts to develop water storage projects; identify potential sources of funding in the private sector and include these in funding packages for specific projects; help develop a biennial report on water storage activities, as outlined in Subsection 1; and perform other duties as assigned.

The Department of Natural Resources and Conservation needs to revise its policy of limiting grant awards under the Water Development Program to \$100,000.

The Department of Fish, Wildlife and Parks, in cooperation with the Department of Natural Resources and Conservation, needs to study the feasibility for having recreational beneficiaries repay some of the project costs through user fees.

Resource Conservation and Development Areas and Water Storage Districts need to develop funding packages and support water storage development. They also need to develop mechanisms to charge flood control and navigation beneficiaries.

Water storage development sponsors should continue to use general tax revenues for a portion of irrigation,

hydropower, municipal, industrial, fish, wildlife, recreational, and other environmental benefits related to water storage projects.

Financial Requirements and Funding Strategies

Sufficient funds will need to be authorized both legislatively and administratively to hire a water storage development coordinator, and for the coordinator to carry out his or her responsibilities.

Plan Implementation Summary

<u>Activity</u>	<u>Responsibility</u>	<u>Deadline</u>
Issue 1 - Information and Education		
Hire a water storage development coordinator	Legislature and DNRC	June, 1991
Document programs	Water storage development coordinator	January, 1992
Issue 2 - Water Development Programs		
Create a water storage special revenue account	Legislature	April, 1991
Reallocate more non-renewable resource funds to renewable resource development	Legislature	April, 1991
Authorize RIT funds for water storage	Legislature	April, 1991
Delete the \$100,000 cap for Water Development Program grants	DNRC	June, 1991
Issue 3 - Cost-sharing and Coordination		
Create Water Storage Districts	Legislature	April, 1991
Develop funding packages and coalitions	RC&Ds and Water Storage Districts	Ongoing
Integrate private sources of funding	Water storage development coordinator	Ongoing
Issue 4 - Payment by Beneficiaries		
Assess the appropriateness of fees paid by irrigation, hydropower, municipal, and industrial beneficiaries	Water storage development coordinator	Ongoing
Conduct a study on recreational user fees	DFWP and DNRC	July 1991
Charge flood control and navigation beneficiaries	RC&Ds and Water Storage Districts	Ongoing
Use general tax revenues for a portion of irrigation, hydropower, municipal, and industrial, fish, wildlife, recreational, and other environmental benefits	Water storage development sponsors	Ongoing

SUBSECTION 3: WATER STORAGE REGULATIONS

The planning, construction, operation, maintenance, and rehabilitation of water storage facilities in Montana is regulated by a multitude of federal, state, and local laws and administrative rules as well as international, interstate, and tribal treaties and compacts. In those laws, rules, and agreements, various requirements are designed to protect public interests in water appropriation and use, health and safety, environmental conservation, and cultural site preservation.

Examples of regulations that protect the interests of Montana's citizens include the Montana Water Use Act, which provides for the granting of water rights for a wide diversity of beneficial water uses including water stored for irrigation, hydropower, and recreation. Other laws regulate water storage by requiring minimum streamflows to maintain water quality and by governing construction of storage facilities to protect public health and safety. Examples include the Federal Safe Drinking Water Act, the Federal Power Act, the Montana Dam Safety Act, and local flood plain ordinances. Laws such as the Federal Endangered Species Act, Wild and Scenic Rivers Act, and National Historic Preservation Act guard environmental and cultural values by prohibiting storage or requiring mitigation where storage may impact natural resources, important wildlife species, or historical sites.

The state also has obligations under international, interstate, and tribal treaties and compacts that may limit the availability of water for storage. For example, the 1909 Boundary Waters Treaty between the United States and Canada provides for the division of flows in the Milk and St. Mary rivers. The Yellowstone Compact is an interstate agreement allocating basin water between Montana, Wyoming, and North Dakota. Indian tribes have rights to use water under state and federal laws.

The laws, regulations, and agreements applicable to water storage are summarized in the water storage regulations background document which is available from the DNRC upon request. A preliminary review indicated that some requirements may unduly hinder water storage development in Montana. The identified issues are addressed in this water plan section.

POLICY STATEMENT

Water storage is one of several tools available for managing Montana's water resources. A substantial number of laws and regulations affect water storage activities and

are necessary to protect vital public interests and environmental values. The state of Montana should act to ensure that laws and regulations are reasonable and properly administered to allow for the use of storage as a viable water management tool.

ISSUES, OPTIONS, AND RECOMMENDATIONS

Issue I - Duplicative Laws and Regulations

Some laws and regulations contain duplicative requirements, result in overlapping administrative authorities, and set forth conflicting definitions. For example, high-hazard dams in Montana located on certain national forest land are governed by similar requirements under the Montana Dam Safety Act, Federal Land Policy and Management Act, and federal Wilderness Act. In addition, definitions of such terms as "navigable" and "stream bed" differ between laws and may be inconsistent. As a result, water storage development and operation may be unnecessarily cumbersome and confusing.

Options

1. Identify unnecessary duplications and inconsistencies and recommend corrective measures. This evaluation could address one or more of the following issues.
 - a. Identify duplicative requirements, overlapping administrative jurisdictions, and inconsistent definitions of common terms.
 - b. Identify federal laws whose administration could be assumed by the state to improve efficiency and enhance sensitivity to local problems and concerns.
 - c. Identify overlapping state regulatory authority.
2. Designate a lead agency to coordinate all water storage permitting.
3. Take no action. The existing requirements, authorities, and definitions are appropriate to manage the resource.

Recommendation

Option 1. The evaluation and corrective measures will streamline regulation of water storage development.

Issue 2 - Costs Related to Dam Safety

Structural repairs or construction of existing and proposed high-hazard dams may be prohibitively expensive. One factor affecting costs are dam safety regulations. The Montana Dam Safety Act establishes the degree of risk to life and property that is acceptable with respect to a high-hazard dam, defined as any dam or reservoir that, if it fails, would likely cause a loss of life. Classification as a high-hazard dam does not imply nor determine whether or not the dam is structurally sound. If risks to public safety are increased—for instance, accepting more than one lost life or allowing a lower minimum spillway capacity—the costs of rehabilitating existing dams and building new facilities would decrease. Conversely, increased safety raises costs. In general, the administrative rules implementing the Montana Dam Safety Act require high-hazard dams to satisfy federal standards. However, standards in the Montana Dam Safety Act for designing spillways are less stringent than federal standards.

The administrative rules implementing the Montana Dam Safety Act require that, by July 1, 1995, existing high-hazard dams, as identified by the Corps of Engineers in 1981, must obtain an operating permit from the Department of Natural Resources and Conservation verifying that the dams satisfy safety standards. To date, studies have been completed on only approximately 33 of 85 high-hazard reservoirs to determine the modifications needed to satisfy the standards. Costs of rehabilitating state-owned high-hazard dams is expected to exceed \$200 million. The costs of engineering studies and rehabilitation construction may be prohibitively expensive, thereby causing a delay or an inability to meet dam safety standards.

Options

1. Revise the Montana Dam Safety Act to increase the acceptable degree of risk to public safety and to reallocate responsibility for that risk between the public, government, and dam owners.
2. Repeal the Montana Dam Safety Act and defer all dam safety activities to the federal government.
3. Evaluate the Montana Dam Safety Act and implementing regulations to:
 - a. Determine the acceptable degree of risk to public safety and appropriate allocation of responsibility for that risk between the public, government, and dam owners.
 - b. Determine whether the definition of a high-hazard dam should be modified.

- c. Determine whether the high-hazard classification should be expanded into a risk scale that allows structural design requirements to reflect probable risk to life and property.
 - d. Determine whether the Department of Natural Resources and Conservation should be given greater discretion to substitute alternative means of addressing risks, such as early warning systems, for structural design requirements.
4. Take no action. The current provisions of the Montana Dam Safety Act appropriately address dam safety concerns.

Recommendation

Option 3. Dam safety is an important public policy issue, and acceptable risks to public safety must be determined. In recommending Option 3, the State Water Plan Advisory Council acknowledges that the DNRC should assess alternative means of addressing risks, such as requiring early warning systems and balancing risks with consequential costs, and initiate rulemaking as appropriate.

Issue 3 - Inability of Private Entities to Obtain Water Reservations

Under the Montana Water Use Act, only public entities may apply to reserve water for existing and future beneficial uses, including those involving the storage of water. Private entities are prohibited from directly obtaining water reservations. Another way to secure water for future uses is to extend the time limit for developing water rights. Excluding private entities from acquiring water reservations may preclude some private development of water storage having public benefits. In addition, while the Montana Water Use Act allows water reservations for multi-purpose uses, there may be perceptions that water reservations are for single-purpose uses only.

Options

1. Revise the Montana Water Use Act to allow private entities to obtain water reservations.
2. Revise the Montana Water Use Act to extend the 10-year limit on developing water use permits associated with water storage development.
3. Provide public education to encourage water reservations for multipurpose uses.

4. Designate or create a public body to advance water reservation applications for private entities.
5. Evaluate the Montana Water Use Act and the desirability of:
 - a. Allowing private entities to obtain water reservations.
 - b. Designating or creating a public body to advance water reservation applications for private entities.
6. Take no action. The Montana Water Use Act appropriately guides beneficial water uses.

Recommendation

Options 2, 3, and 5. By extending the time limit for developing water rights associated with water storage, private development of storage projects will be facilitated. The policy restricting water reservations to public entities should be re-evaluated to determine whether the public use preference should stand.

Issue 4 - Lack of Information about Water Storage Laws

No comprehensive source of information exists on the laws and regulations affecting the development and operation of water storage projects. Consequently, potential project developers may be unaware of the legal requirements that must be met as well as the resources available for assistance. Development of water storage projects may be facilitated by easy access to this information.

Options

1. Prepare, distribute, and regularly update (1) a listing of laws and regulations applicable to water storage, and (2) a booklet describing the major requirements and identifying administrative agencies; both suitable for use by laypersons.
2. Develop and administer a targeted program of education to promote awareness of legal requirements and sources of information applicable to the development and operation of water storage projects.
3. Designate a person to serve as an information coordinator for permitting and regulatory issues related to water storage development.

Recommendation

All options. These activities would make information accessible and assist in the proper development of water storage facilities.

Issue 5 - Repairing Wilderness Area Dams

Rules and regulations pursuant to the Wilderness Act may constrain the maintenance or rehabilitation of dams in wilderness areas. The use of mechanized equipment in designated wilderness areas for maintenance or rehabilitation is prohibited, except where such use was practiced prior to wilderness designation or is authorized by the Chief of the Forest Service under specifically approved guidelines. There are 16 dams in Montana's wilderness areas that potentially threaten public safety, and others may exist in future wilderness designations.

Potential problems related to dams located in wilderness areas include (1) regulations governing wilderness areas may hinder dam maintenance, (2) rule implementation may impede dam maintenance, (3) dam owners may not understand the regulations affecting the use of mechanized equipment to maintain dams, and (4) dam owners, for any number of reasons, may not be willing or able to comply with wilderness area regulations. Any one or combination of these problems has, in some cases, led to dams deteriorating to the point where they may threaten public safety.

Options

1. Develop an informational program describing the application procedure for the use of mechanized equipment and other rules applicable to dam repair in wilderness areas.
2. Develop a training program for state and federal administrators to promote better implementation of regulations governing wilderness areas.
3. Develop more detailed guidance in the wilderness regulations promoting public safety through dam maintenance procedures.
4. Develop a public process, which may include the U.S. Forest Service, Bureau of Land Management, Department of Natural Resources and Conservation, dam owners, conservationists, consultant firms, and other interested persons, to identify problems and develop appropriate solutions.

Recommendation

Option 4. Since the nature and scope of the problem is unclear, further examination by affected parties is necessary.

sary.

PLAN IMPLEMENTATION

Legislative Action

The Water Policy Committee needs to reevaluate the acceptable degree of risk to public safety under the Montana Dam Safety Act. The Water Policy Committee also needs to consider the public policy of extending water reservations to private entities under the Montana Water Use Act.

The legislature needs to revise the Montana Water Use Act to extend the 10-year limit on developing water use permits associated with water storage development.

Administrative Action

The Department of Natural Resources and Conservation needs to evaluate federal, state, and local laws and regulations applicable to water storage to identify duplicative requirements, overlapping administrative authorities, and conflicting definitions and make reports and recommendations to the State Water Plan Advisory Council, Board of Natural Resources and Conservation, Legislative Water Policy Committee, and legislature as appropriate.

The Department of Natural Resources and Conservation needs to draft administrative rule changes to implement decisions of the Legislative Water Policy Committee.

The Department of Natural Resources and Conservation and the Montana Water Resources Center need to develop

and administer a targeted education program to: (1) encourage water reservations for multipurpose uses, and (2) promote awareness of legal requirements and sources of information applicable to the development and operation of water storage projects.

The Department of Natural Resources and Conservation needs to prepare, distribute, and regularly update (1) a listing of laws and regulations applicable to water storage, and (2) a booklet that describes the major requirements and identifies administrative agencies; both suitable for use by laypersons.

The Department of Natural Resources and Conservation needs to designate an individual to serve as an information coordinator for permitting and regulatory issues related to water storage development.

The Department of Natural Resources and Conservation needs to develop, in cooperation with appropriate federal and state agencies, a public process to identify problems associated with the maintenance of dams in wilderness areas and develop appropriate solutions.

Financial Requirements and Funding Strategies

The legislature needs to provide adequate funding for the Water Policy Committee to conduct a water storage regulation study. Approximately \$5,000 is needed during the 1991-92 biennium for the Department of Natural Resources and Conservation to print and distribute the water storage regulation matrix and booklet.

Plan Implementation Summary

<u>Activity</u>	<u>Responsibility</u>	<u>Deadline</u>
Issue 1 - Duplicative Laws and Regulations Water Storage Regulation Study	DNRC	November, 1992
Issue 2 - Costs Related to Dam Safety Water Storage Regulation Study	Legislative Water Policy Committee DNRC	November, 1992
Issue 3 - Inability of Private Entities to Obtain Water Reservations Water Storage Regulation Study Public Education	Legislative Water Policy Committee DNRC and Montana Water Resources Center	November, 1992 January, 1992/ Ongoing
Issue 4 - Lack of Information about Water Storage Laws Designate a water storage coordinator Prepare and distribute water storage regulation listing and booklet Public education	DNRC Water storage coordinator Water storage coordinator	June, 1991 January, 1992 January, 1992/ Ongoing
Issue 5 - Inability to Repair Wilderness Area Dams Sponsor a public forum	Governor's Office DNRC U.S. Forest Service	December, 1990

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INTRODUCTION

Agriculture is Montana's largest business, providing about one-third of the total state income from primary industries. Irrigation contributes roughly one-quarter of agricultural income and, importantly, stabilizes agricultural production during the all-too-frequent dry years. Satisfying agriculture's vital demand for irrigation water requires the development and extension of water supplies through a combination of management strategies, including water storage. Another method is to improve the efficiency with which water is used.

The benefits of improved agricultural water use efficiency are diverse and include:

1. Improved ability to withstand periods of drought.
2. Increased irrigated acreage through the use of saved water.
3. Improved performance of aging irrigation facilities.
4. Increased irrigators' profits when the benefits of more efficient water use (increased crop production and sometimes decreased operating costs) are greater than the investment cost.
5. Reduced soil erosion and improved water quality.
6. Help in meeting the needs of current water users once the prior reserved rights of Indian tribes and the federal government are quantified and put to use.

Along with these benefits, improving water use efficiency may be important in terms of interstate water allocation. The U.S. Supreme Court has indicated that state conservation efforts will be considered if it is called upon to divide the waters of interstate rivers. The Court could decide to award smaller shares to states making no effort to increase water use efficiency, reasoning that these states could meet their future needs by saving more water.

BACKGROUND

Any strategy to improve agricultural water use efficiency must reflect an appreciation of several difficulties. First, because each irrigation situation is different, improving water use efficiency requires a case-by-case consideration of a number of complex geologic, hydrologic, and economic factors. Second, irrigation efficiency improvements can be very expensive. Third, water uses within a basin can be extremely interdependent. One irrigator's

return flows or recharge to ground water can be another irrigator's water supply. Therefore, improving the efficiency of one water user could adversely affect the water supply of others. Fourth, while Montana law protects water users from adverse effects caused by other people's changes in water use, the law does not clearly establish who owns the right to water saved without adverse effects to others.

A number of options are already available to overcome some of these problems. The Montana Cooperative Extension Service, local conservation districts, and a number of other state and federal agencies provide technical assistance and information on water conservation measures. The Montana University System also supports research to improve our understanding of the complex factors that affect irrigation efficiency. Research may also help develop improved irrigation practices and technologies.

Funding assistance is available for irrigation efficiency improvements from a number of sources. These sources include the U. S. Agricultural Stabilization and Conservation Service, Farmers Home Administration, Soil Conservation Service, and the Montana Water Development Program administered by the Department of Natural Resources and Conservation (DNRC).

Given that one irrigator's water losses can be another irrigator's water supply, improvements in water use efficiency may adversely affect some water users. In light of this, the law provides potentially affected parties the right to object to certain changes in water use. Accordingly, the objective of increased water use efficiency is not to reduce the amount of water that is later reused. Rather, it is to decrease losses such as: (1) water used by weeds or other unwanted vegetation; (2) evaporation of standing water; (3) water that is not consumed but becomes inaccessible for reuse; or (4) water that becomes unusable because its quality has deteriorated.

The final difficulty stems from the fact that our water law is not clear on the question of who holds the right to salvaged water. In Montana, water rights are based on the amount of water historically put to beneficial use. If an irrigator decreases his use over time because of improved efficiencies, the legal status of the water no longer needed can be called into question. By one interpretation, this part of the water right would be considered abandoned and the water would go to the next junior user. Obviously, this would not encourage increased efficiency. Under a second interpretation, an irrigator who increases his efficiency retains the right to the salvaged water, so long as other water users would not be adversely affected by the change in water use. The irrigator may then have the option to expand

his irrigated acreage, sell, or otherwise benefit from the right to the salvaged water. Using this interpretation, an irrigator may be rewarded, rather than penalized, for becoming more efficient.

STATE WATER PLAN POLICY STATEMENT

Voluntary improvements in agricultural water use efficiency that expand water supplies for agriculture and other uses should be encouraged. Where improvements in water use would adversely affect other existing beneficial uses, such improvements should not be allowed.

ISSUES AND RECOMMENDATIONS

Issues

To encourage voluntary improvements in agricultural water use efficiency, three groups of issues must be successfully addressed.

1. Adequate information and educational opportunities must be readily available to irrigators, and research must be continued. How difficult is it for irrigators to obtain this information? Is it presented in a manner that is clear and persuasive? Are there adequate data for evaluating applications for water right changes in terms of adverse effects upon other water users? Is improving irrigation technologies and practices receiving adequate priority in the competition for agricultural research dollars?
2. Funding assistance may be necessary for those wishing to improve irrigation efficiency. Are existing programs capable of meeting future demands for funding? Are the kinds and levels of support adequate? Should the state Water Development Program give special consideration to irrigation efficiency-improving proposals? Are other sources of funding available, particularly for the rehabilitation and betterment of aging irrigation projects?
3. Laws clarifying who owns the right to salvaged water must be enacted to provide clear incentives for more efficient use. But when an irrigator increases efficiency, how will the amount of water salvaged be determined? Will it include water that otherwise would have been return flows? How will other water users be protected from adverse effects? Should restrictions be placed on how the saved water can be used?

Recommendations

In response to these issues, the following recommendations have been adopted:

1. The adequacy and effectiveness of existing information and research programs should be evaluated. Information should be provided to the state's irrigation districts and other organized irrigation associations on the availability of technical and financial assistance for improving irrigation efficiency. Further, these entities should be informed of their option under state law for the use of salvaged water.
2. Support for federal programs providing financial and other local level assistance to irrigators should be maintained. Special consideration should be given in the state Water Development Program for projects that would improve the efficiency of existing irrigation systems. Funds from the federal Pick-Sloan Missouri Basin Program should be allocated for use in the rehabilitation and betterment of irrigation projects.
3. The law should clearly provide that if an irrigator salvages water, he maintains the right to use the water. However, salvaged water must be defined to include only water that has not been available for reuse by other water users.

PLAN IMPLEMENTATION

Legislative Action

To provide effective financial support, the legislature should adopt a resolution urging Congress to authorize and appropriate funds from the Pick-Sloan Missouri Basin Program for the rehabilitation of irrigation projects. Such funding can be justified as compensation for water development projects promised to Montana under the 1944 Flood Control Act, but never received.

Legislation also should be passed that clarifies the rights of water users to salvaged water. Such legislation should carefully define "salvaged water" to include only the saved water that otherwise would have become consumed or unusable for other existing appropriators. The use of salvaged water for a different purpose, in a different place, from a different point of diversion, or from a different source of storage would require a change in water right in accordance with Montana law.

Administrative Action

To improve education and research on irrigation efficiency, the DNRC, in cooperation with the Montana Cooperative Extension Service and the U.S. Soil Conservation Service, should evaluate the effectiveness of existing research and public education programs. A report should be prepared to the State Water Plan Advisory Council that sets forth recommendations for any improvements in these programs.

The state's irrigation districts and other organized agricultural water user groups should be informed of available technical and financial assistance for improving irrigation efficiency. They should also be informed of the opportunity to use salvaged water if the legislation recommended above is enacted.

To assure continued federal government support for improving agricultural water use efficiency, the DNRC should continue to monitor and support federal funding for programs or projects that improve agricultural water use. In addition, the Water Development Program should give special consideration to project proposals that improve the efficiency of existing irrigation projects. The Governor's Office and the DNRC should also pursue all administrative and intergovernmental channels available to obtain Pick-Sloan funding for irrigation project rehabilitation.

Financial Requirements and Funding Strategies

It is anticipated that the administrative actions can be accomplished with current levels of funding.

Time Schedule

Activity	Responsibility	Deadline
A. Development and Implementation Tasks		
1. Draft Legislation	DNRC	January 1989
2. Enact Legislation	Legislature	April 1989
3. Contact irrigation districts and water users' associations	DNRC	May 1989
4. Complete evaluation report on irrigation efficiency information and research	DNRC	September 1989
B. Ongoing Tasks		
1. Rank irrigation efficiency project proposals to the Water Development Program	DNRC	
2. Monitor and support federal funding, including Pick-Sloan Program Funding	DNRC/Governor's Office	

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INTRODUCTION

Information on the quantity, quality, distribution, and allocation of Montana's water resources provides a foundation for sound planning and management decisions. Under Montana law, the Montana Department of Natural Resources and Conservation (DNRC) has a mandate to "gather from any source reliable information relating to Montana's water resources and prepare therefrom a continuing comprehensive inventory of the water resources of the state (Section 85-1-203(1), MCA). Moreover, DNRC is required "in cooperation with other state agencies, institutions, colleges, and universities to establish and maintain a centralized and efficient water resources data management system sufficient to make available and readily accessible, in a usable format, to state agencies and other interested persons, information on the state's water resources, out-of-state water resources that affect the state, existing and potential uses, and existing and potential demands" (Section 85-2-112(4), MCA).

Since 1986, the DNRC has cooperated with the Natural Resource Information System (NRIS), a program of the Montana State Library, in developing a comprehensive water resources data management system. Known as the Montana Water Information System (MWIS), the system is designed to serve as a clearinghouse for all water data sources and users. Developed under the guidance of representatives from several state and federal water management agencies, MWIS does not duplicate the efforts of these organizations, but coordinates information exchanges among state, federal, and private water users and managers.

BACKGROUND

Given the wide variety of water uses in the state of Montana, it is not surprising that there are several organizations involved in collecting and maintaining many different types of water resource information. DNRC, the Department of State Lands, the Department of Health and Environmental Sciences, and the Department of Fish, Wildlife and Parks all have active programs that involve the collection and use of water quantity or quality data. There is also a vigorous program related to the development of a water rights data system at DNRC. The Statewide Groundwater Information Center located at the Montana Bureau of Mines in Butte serves as a storage and retrieval facility for groundwater data. In Bozeman, the Surface Water Information Center of the Water Resources Center at Montana State University serves as a data repository for water-related research conducted in the university system.

On the federal level, agencies such as the U.S. Geological Survey, the Soil Conservation Service, the U. S. Forest Service, the Environmental Protection Agency, the Bureau of Land Management, and the Bureau of Reclamation are active in the water data management area. Finally, there are a number of private-sector consulting firms and resource development companies whose activities often include the collection of water data.

Each organization typically collects water-related information for its own purposes and, for a variety of reasons, this often results in a duplication of efforts. First, there is often a large amount of data being collected and maintained in a variety of formats, ranging from manual systems to extensive computer data bases. In many cases, the structure or content of the data bases may be incompatible, and thus it may be more efficient for an agency to collect new data rather than convert existing data to a format it can use. Second, because there are no standards for collecting and maintaining water-related information, there is often a question as to the reliability and usability of existing data. Finally, it is often more efficient to collect new data than to spend time trying to find out which organization has the needed information.

The Montana Water Information System was developed to help eliminate the duplication of data management efforts and to facilitate access to needed information. The first step in developing the program was to form a Water Resources Data Management System Advisory Committee. Composed of representatives from several state water data collection and management agencies, the committee provided policy guidance in designing a water data management system under the NRIS program. After meeting several times in 1986, the committee concluded that a new, centralized data system that ties all users into a single information base would be too costly to implement, too difficult to design for all uses, and, given the diverse needs of users, too complex for all users to operate. Instead, the Committee recommended developing a central access point to all the various data sources in the state. In other words, the MWIS program does not serve as a central data storage facility, but rather as a means to identify sources of important data and then coordinate access to those sources. This decentralized data base strategy enables each agency to continue managing its data to meet its own specific needs, and allows for maximum sharing of water data among participating agencies, as well as facilitating centralized data collection for specific issues or basins.

The objectives of the MWIS program are: (1) to determine the water data storage and retrieval needs of Montana data users; (2) to design a water data storage and retrieval system that meets user needs in Montana; (3) to establish

a central point of contact and to coordinate quick and efficient access to existing sources of water information for any particular geographic area of the state; (4) to design and promote a quality control system to ensure the usefulness of the data; and (5) to identify potential and existing duplicative data collection efforts for the purposes of reducing or eliminating such efforts and reducing the resultant costs.

To achieve these objectives, the following activities are currently underway and scheduled for completion by June 1989: (1) developing a data base on water resources information sources in the state; (2) accessing other data bases; (3) designing quality control criteria to ensure the compatibility of data management activities; and (4) surveying other state water information management systems. Once these initial activities have been completed, the MWIS program will be maintained and refined as advances in data management technology occur.

STATE WATER PLAN POLICY STATEMENT

A comprehensive water information system is needed to improve the management of Montana's water resources by promoting coordination among water managers and users, as well as eliminating duplication of effort in the collection, storage, and retrieval of water-related information.

ISSUE AND RECOMMENDATION

Issue

The basic issue regarding water data management is: What type of information management system will best meet the needs of water resource decision makers while responding to the legislative mandate for an efficient water data management program?

Recommendation

Sustaining the ongoing MWIS program is recommended as the most appropriate approach to managing Montana's water resource data. This program serves the diverse needs of water data users by providing a central access point to decentralized data bases. It eliminates the duplication of effort by enabling each agency to continue managing its own data to meet its specific needs while allowing for the maximum sharing of water data among participating agencies. The existing program also improves the efficiency

and effectiveness of water management activities by identifying and disseminating water-related information in a timely and efficient manner.

MWIS also facilitates the use of such state-of-the art information management technology as a Geographic Information System. Using such a system, information can be assimilated and presented in a variety of formats, from technical reports to maps, as needed in regulatory, management, planning, and research decision making. Given the different needs of various water data users, this type of system is widely recognized as the most efficient and cost-effective approach to developing a comprehensive, integrative water data management system.

PLAN IMPLEMENTATION

Legislative Action

The legislature would not need to revise or adopt legislation to authorize the development of a water data management system. However, it is critical that the legislature provide the financial support needed to maintain, refine, and enhance the existing MWIS program.

Administrative Action

Several administrative actions are necessary to implement the recommended option. These actions are described according to the functions of the MWIS staff and the MWIS Advisory Committee.

A. MWIS Staff

1. Complete the current program activities and produce a report that summarizes the findings;
2. Maintain a central access point to data for water information users;
3. Maintain the staff needed to ensure the proper operation of the MWIS program;
4. Receive direction from the MWIS Advisory Committee whose function is to assist the program staff with the development and operation of the data management program;
5. Seek funding for additional microcomputers (with modems) to accommodate increased public use of MWIS by allowing more than one user to access MWIS at a given time, as well as allowing remote access to the system.

6. Cross-train MWIS, NRIS, and State Library staffs to familiarize them with the various data bases being accessed by MWIS, thus enhancing program capabilities to respond to data requests.
7. Provide training to system users to encourage remote and independent use of MWIS.
8. Develop a system for tracking current and anticipated data collection efforts in Montana to enhance information sharing among data users and to discourage duplication of effort.

B. MWIS Advisory Committee

1. Expand the advisory committee to include experts in Geographic Information System(s) and natural resources management from state and federal agencies;
2. Provide guidance in identifying computer needs, developing data standards, and identifying funding sources for the acquisition of selected types of data;
3. Prioritize what data are needed to meet the most critical water resource issues facing Montana; and
4. Coordinate the development and utilization of new data management tools, such as a Geographic Information System.

Financial Requirements and Funding Strategies

It is estimated that funding in the amount of \$100,000 is needed during the 1990-1991 biennium to maintain and further develop the MWIS program. This funding is being sought through four basic approaches:

1. Negotiate interagency agreements to provide specific data management services for compensation, approximately \$25,000 was acquired during fiscal years 1988 and 1989 and additional agreements are expected in the future.
2. Apply for grants and seek non-state funding. For the 1990-1991 biennium, NRIS has applied for a Renewable Resources Development Grant of \$99,806. Approximately 36 percent of the grant, or \$35,930, would be allocated to MWIS. NRIS has also applied for a Water Development Grant of \$45,510.
3. Request general funds in the event that grants are not available. Although a request for such funds was not made for the 1990-1991 biennium, the director of the Budget Office has indicated he will consider a late request if grant funding is not obtained.
4. Investigate the feasibility of relying on user fees to partially fund the activities of MWIS.

Time Schedule

	Activity	Responsibility	Deadline
A.	Development and Implementation Tasks		
	1. Design MWIS program	MWIS/Advisory Committee	August 1988
	2. Establish central point of contact	MWIS	September 1988
	3. Expand Advisory Committee	MWIS/Advisory Committee	December 1988
	4. Design quality control criteria	MWIS/Advisory Committee	June 1989
	5. Train State Library and NRIS staff	MWIS	March 1990
	6. Provide on-line and remote access to MWIS	MWIS	October 1990
	7. Train users of MWIS	MWIS	June 1991
	8. Develop system for tracking data collection efforts	MWIS	October 1991
B.	Ongoing Tasks		
	1. Determine water data needs and sources	MWIS/Advisory Committee	
	2. Access data bases	MWIS	
	3. Promote quality control criteria	MWIS	
	4. Coordinate the development and utilization of data management tools	MWIS/Advisory Committee	



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INTRODUCTION

Water uses may be differentiated on the basis of whether they involve withdrawing water from a source of supply. Offstream uses divert water from a natural watercourse. This withdrawn water is then either used and returned to the watercourse or completely consumed. By contrast, instream uses maintain a specified level of flow in the natural watercourse.

The allocation of water in Montana has traditionally focused on the important task of satisfying offstream uses for domestic and commercial purposes, irrigated agriculture, industry, and mining. While these offstream uses remain critical to the growth and development of the state, there has been an increasing demand to leave water in the stream, unavailable for offstream diversion below a specified level, for fish, wildlife, recreation, and water quality. Montana law (Section 85-1-101(5), MCA) provides that "The water resources of the state must be protected and conserved to assure adequate supplies for public recreational purposes and for the conservation of wildlife and aquatic life." In addition, Section 75-5-101(1), MCA states that "It is the public policy of this state to conserve water by protecting, maintaining, and improving the quality and potability of water for public water supplies, wildlife, fish and aquatic life, agriculture, industry, recreation, and other beneficial uses."

Based on these and other statutory policies, natural resource management agencies are taking steps to protect instream flows through a variety of programs and practices. The purpose of this plan component is to identify the issues involved with maintaining and enhancing instream flows, and to present recommendations for resolving them.

BACKGROUND

In 1969, the state took its first steps to statutorily allocate water for instream use. The Legislature established so-called "Murphy Rights" on the unappropriated waters of twelve "blue ribbon" trout streams to maintain stream flows necessary for the preservation of fish and wildlife habitat (Section 89-801(2), RCM, 1947). In 1973, state efforts were expanded with the enactment of the Montana Water Use Act, which not only provided an opportunity to reserve water for future diversionary and consumptive uses, but also for maintaining instream flows (Section 85-2-316, MCA). To date, instream reservations have been established only in the Yellowstone River Basin. Several other streams have received instream flow protection pursuant to Section 85-2-223, MCA, which allows the

Montana Department of Fish, Wildlife and Parks to represent the public in adjudication proceedings for purposes of documenting public recreational uses of water established prior to 1973. Instream flows are also maintained on several streams by releasing water from reservoirs during critical times of the year. Finally, the Department of Natural Resources and Conservation (DNRC) may condition water use permits for large appropriations on the basis of reasonable use criteria which include the protection of instream flows (Section 85-2-311(2)(c), MCA).

In addition to state efforts to protect instream resources, federal agencies and tribal governments have also taken steps to ensure the maintenance of instream flows. The Wild and Scenic Rivers Act (16 U.S.C. 127) has been used to protect instream resources on the North, South, and Middle Forks of the Flathead River, and on one reach of the Missouri River. Federal land management agencies are studying the possibility of adding rivers to the wild and scenic river system, thereby protecting additional instream resources. Through its special use permitting process, the U.S. Forest Service also protects instream flows by regulating access to developers seeking to divert water within the national forests (43 U.S.C. 1761-1771 (1982)). The federal reserved water rights doctrine may give federal resource management agencies and tribal governments another mechanism to manage instream resources. Finally, tribal governments, such as the Confederated Salish and Kootenai Tribes of the Flathead Reservation, are claiming aboriginal fishing rights to protect instream flows under their respective treaties with the United States.

Although the state of Montana has made significant progress in protecting instream flows, some of the existing programs and practices need refinement if they are to be effective. In certain cases, new legal and institutional mechanisms also may be needed to enhance instream resources.

STATE WATER PLAN POLICY STATEMENT

Instream flows are an important use of water, and mechanisms should be developed and refined to protect and enhance instream resources. However, instream flow protection activities must not adversely affect existing water rights and should be weighed and balanced against alternative future uses of water.

ISSUES AND RECOMMENDATIONS

Issues

Four issues need to be addressed with respect to instream flow protection. They are:

1. Inadequate consideration of instream flow values in the water use permitting process.
2. Insecurity of instream water reservations.
3. Need for enhancement of instream resources in dewatered basins.
4. Need for research on instream resource management decisions.

Recommendations

1. Permitting Process

The existing criteria for issuing a water use permit, as outlined in Section 85-2-311, MCA, may not adequately provide for the consideration of instream flow values. It is not clear whether the water permitting process allows for the consideration of instream flow values other than when instream flow water rights have been established. To date, many streams in Montana with important instream values do not have the necessary protection of an instream flow right. Water permits for new consumptive use continue to be granted before instream flow rights are established. Consequently, in certain areas of Montana, instream resources are subjected to further depletions.

The recommended solution to this issue is to promote more timely acquisition of instream flow reservations by assigning a priority date at the time a qualified applicant submits a notice of intent to reserve water (instead of several years later when final reservation decisions are made). Under this approach a "base" priority date would also be established for all reservants at the time the first notice is submitted for any given stream reach or river basin. Once such a notice is submitted, all qualified applicants with an interest in the stream (including those needing water for offstream purposes) would have the opportunity to prepare and submit applications within a specified time period and receive the same base priority date. In making its final decision on the applications, the Board of Natural Resources and Conservation (BNRC) would also weigh and balance the reservation requests against water use permits granted since the base priority date. The BNRC could subordinate reservations to water

use permits if the purpose of the reservations is not substantially impaired.

2. Security Of Instream Reservations

The current reservation process may not provide adequate security to instream reservations. If the BNRC finds that the total amount of an instream flow reservation is not needed to fulfill its purpose, and a qualified applicant can show that its need outweighs the need of the instream reservation holder, the excess water may be reallocated to the competing applicant (Section 85-2-316(11), MCA). Such actions may not occur more than once every five years. Moreover, all reservations are to be reviewed at least once every ten years, and if the objectives of the reservation are not being met, the Board may extend, revoke, or modify the reservation (Section 85-2-311(10), MCA).

The recommended solution to this issue is to evaluate the relative security of instream flow reservations after the BNRC completes its review of the Yellowstone River reservations in 1989. This strategy is recommended because it is difficult to evaluate the security of instream reservations, and thus determine what action is needed, without first going through the process of making a ten-year review. The evaluation would identify and assess all the problems associated with the security of instream reservations.

3. Enhancing Instream Flows

Instream resources are often threatened in streams that are subject to regular or periodic low flow conditions. The issue here is not how to maintain existing flow levels, but how to increase or enhance the flow levels in certain streams.

The first recommendation to address this issue is to allow the Department of Fish, Wildlife and Parks to lease water rights from offstream or consumptive uses for purposes of protecting instream flows in important stream reaches. This opportunity is entirely voluntary and would not jeopardize existing offstream water rights. It would result in the temporary transfer of an offstream water right to enhance instream flows during critical low flow periods. Under the lease agreement, the offstream water user would still hold the water right and be compensated for leaving water in the stream during certain years. This recommendation would also allow for the temporary emergency leasing of offstream or stored water rights to protect instream resources during critical low flow periods. Leases under this approach could not occur if they would result in adverse effects to existing water users.

A second recommendation is to support public entities in purchasing or leasing water stored in reservoirs above dewatered streams and in revising the operating procedures on such reservoirs. In addition, the feasibility of new storage projects to enhance instream resources should be assessed. Finally, cooperative solutions at the local level, such as irrigation scheduling, are supported.

4. Research

To improve the management of instream resources, research is needed to evaluate:

- a. The effect of return flows on the maintenance and enhancement of instream resources.
- b. Instream flow quantification methods to determine if existing methods result in an inappropriate amount of water for instream resources.
- c. The physical availability of water to meet the demands for instream resource protection.

PLAN IMPLEMENTATION

Legislative Action

The legislature would have to revise Section 85-2-316(9), MCA to allow the BNRC to establish a base priority date for all reservants at the time the first notice of intent to apply for a water reservation is submitted for a particular stream reach; to define the time limit within which competing applications must be submitted; and to allow the Board to subordinate reservations to water use permits granted since the base priority date.

The legislature would also have to enact a statute to allow the voluntary leasing of water from offstream uses to instream uses. Some of the statutory modifications that may be needed include changing the definition of "appro-

priate" in Section 85-2-102(1), MCA and clarifying the change statute in Section 85-2-402(2)(b), MCA. It may also require a modification or clarification in the abandonment statute in Section 85-2-404, MCA.

Administrative Action

To determine the relative security of instream flow reservations, the DNRC will, in cooperation with the Instream Flow Technical Advisory Committee, evaluate both the five-year and ten-year review processes after the BNRC completes the Yellowstone River reservation review. The DNRC will prepare a brief report for the State Water Plan Advisory Council (SWPAC) outlining the options and recommendations for addressing this problem.

To facilitate research on the three areas outlined above, the DNRC will work in cooperation with the Water Resources Research Center (WRRRC) at Montana State University. The focus of this cooperative effort will be: (1) to identify leading researchers in the topic areas; (2) to survey the current state of research in each of the areas; (3) to consult with resource management agencies and water users to identify research needs; and (4) to outline research strategies, including financial requirements and sources of funding. Research proposals in these three areas will receive a high priority by the Research Center for funding. Periodical "progress reports" will be made to the SWPAC.

To assess the feasibility of new storage projects to enhance instream flows in dewatered basins, this issue should be incorporated into a state water plan section devoted exclusively to water storage projects.

Financial Requirements and Funding Strategies

Funding may be necessary to conduct research on the three areas outlined above. Periodic progress reports to the SWPAC will outline the financial requirements and funding strategies for research.

Time Schedule

Activity	Responsibility	Deadline
A. Development and Implementation Tasks		
1. Draft legislation	DNRC	January 1989
2. Enact legislation	Legislature	April 1989
3. Evaluate security of instream reservations	DNRC	June 1989
B. Ongoing Tasks		
1. Reservoir management and cooperative solutions	DFWP, DNRC, others	
2. Research	DNRC, WRRRC	

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WATER PLAN

Management Section

FINAL

February 1989

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WATER RESOURCES DIVISION • DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

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INTRODUCTION

Since 1920, the Federal Power Act (FPA) (16 USC 791(1982)) has required the Federal Energy Regulatory Commission (FERC) to license any hydropower project that: (1) is located on federal land; (2) uses water impounded by a federal dam; (3) is located in, or uses water from a navigable stream; or (4) produces power which affects interstate commerce. Following the U.S. Supreme Court decision in First Iowa Hydro-Electric Cooperative v. Federal Power Commission, 328 U.S. 152 (1946), FERC is not bound by state laws or policy in determining the number and location of hydropower projects it may license within a state. Not only does FERC's authority to site hydropower dams preempt all state decision-making on the issue, but FERC contends it is not required to consider Montana's water law system of prior appropriation. This relationship between FERC and the state has frustrated the state's attempt to manage its water resources by: (1) not allowing the state to optimize water use when a hydropower project virtually forecloses all future upstream uses; and (2) eroding the state's authority to control the allocation and use of its water.

BACKGROUND

In 1920, when almost one-third of the United States' energy needs were supplied by hydropower, Congress enacted the Federal Water Power Act in response to fears that the hydropower industry could be concentrated in the hands of a few major power companies. The law was amended in 1935 to become the Federal Power Act (FPA) and is administered by the Federal Energy Regulatory Commission. In passing the FPA, Congress seemed to create a balance between state and federal governments in authorizing hydropower projects. The FPA required a license from FERC, but also provided for the application of state water law. However, in its First Iowa decision, the U.S. Supreme Court held that a hydropower project could be federally licensed even though the applicant was in violation of Iowa laws that required a state permit to build a dam and prohibited the dewatering of a stream. The Court's decision was based on grounds that a state license, as a condition precedent to federal action, would: (1) give the states veto power over projects that Congress intended FERC to regulate; (2) allow the states to control the comprehensive planning that congress entrusted to FERC; (3) result in a duplicate system of federal and state licensing that would be unworkable; and (4) make FERC the agent of the states for purposes of enforcing state laws.

Based on First Iowa and subsequent decisions, FERC's position is clear: an applicant for a federal hydropower license does not have to acquire a state water right prior to issuance of the license. In addition, the license may contain a special article allowing additional time to acquire the state water rights necessary to operate the project. If a federal license is issued, the licensee acquires the federal power of eminent domain and may condemn existing rights to acquire water for the project, provided that the right-holder is compensated. Thus, a FERC licensee can be inserted into the water rights system without ever having to comply with state water laws.

The Montana Constitution provides that all waters in the state are the property of the state for the use of its people and are subject to appropriation as provided by law for all beneficial uses, including hydropower. Since passage of the Montana Water Use Act of 1973, an appropriation of water requires a permit from the Department of Natural Resources and Conservation. Disruption of this appropriation system of water rights is only the most obvious and fundamental effect for FERC's disregard of state policies, procedures, and laws. Under the provisions of the Federal Fish and Wildlife Coordination Act and the Electric Consumers Protection Act, FERC must consult with state and federal fish and wildlife agencies when considering the issuance of a federal license (or exemption from licensing) for a proposed hydropower project. In many instances, this consultation leads to the imposition of minimum instream flow requirements on a project's federal license, often in disregard of state water law. Another problem centers on the fact that some hydropower projects may require a large share of the available flow at a certain point on a river. If FERC licenses a project and hasn't fully considered the range of state water management objectives, it may foreclose future agricultural, municipal, and other consumptive water uses upstream from the licensed project.

As demand increases for Montana's limited water supplies, the role of the state in controlling the allocation and management of this resource becomes more critical. Because of its knowledge of existing water use and water availability, the state is in the best position to exercise water management authority, but is frustrated by asserted federal preemption of this authority in regard to FERC hydropower licensing. Therefore, the state wishes to: (1) assure that FERC licensing and relicensing decisions are consistent with state resource management decisions, including the appropriation of water, the siting of hydropower and associated facilities, protection of fish and wildlife, and maintenance of water quality; (2) maximize

state influence on hydropower development in Montana while acknowledging a federal interest in coordinating such development throughout the region; (3) assure that FERC decisions comply with Montana's comprehensive water plans; and (4) guarantee that Montana's water rights system is fully considered in FERC decisions regarding water allocation.

STATE WATER PLAN POLICY STATEMENT

Montana must seek to maximize control over the management of its water resources in matters pertaining to the siting of hydropower generating facilities. Water management agencies as well as hydropower producers in Montana should, to the extent possible, pursue development of common positions when dealing with FERC and matters involving changes to the Federal Power Act.

ISSUE AND RECOMMENDATIONS

Issue

FERC decisions on the licensing of hydropower projects fail to reflect Montana's statutory prerogatives concerning the allocation and management of the state's water resources.

Recommendations

A two-pronged approach for dealing with FERC and the federal process for licensing hydropower projects is recommended.

The first recommendation is to work within the federal hydropower licensing system to influence FERC decisions on the siting and operation of hydropower projects in Montana. This recommendation would entail a state consultation process that includes all concerned agencies and groups, and the hydropower developers. Under this process, applicants for a federal hydropower license would be advised of all state requirements regarding fish and wildlife effects, water quality certification, environmental im-

pacts, water use permits, facility siting, and state water management goals. In addition, the consultation process would facilitate the project's review by state agencies and minimize the conflicts when the application is submitted to FERC. Under this process, holders of existing hydropower licenses and other interested agencies and groups could also seek mutually acceptable means of resolving problems surrounding current operating facilities. Key among the issues that might be involved are fishery enhancement or upstream water development.

Through this approach, state agencies and the hydropower producers would work on the issues surrounding a project and the means to resolve any problems. In turn, it is expected that FERC would accept the conclusions of the Montana consultation process and condition the license accordingly. The process would be defined under the state water plan as the comprehensive analysis that will be submitted to FERC for consideration as required under the Electric Consumer's Protection Act. Each analysis could also be used for interventions in federal hydropower licensing proceedings.

The second recommendation is to pursue statutory changes to the federal hydropower licensing system to maximize state-level control over the allocation and management of Montana's waters. This would largely focus on amending the Federal Power Act. Potential amendments would: assure consultation of state agencies charged with energy facility siting; allow states to collect fees from hydropower license applicants in order to study the impacts of proposed projects; require FERC to defer to state water plans, unless there is an overriding national interest; ensure fish and wildlife protections as provided by the Electric Consumer's Protection Act are sustained; make compliance with state water law a condition of a federal hydropower license; and provide that a water right for a hydropower project can be obtained only in accordance with state law. Another proposed amendment would abolish or limit FERC's authority to license hydropower projects and correspondingly increase state-level authority.

As a final element of this option, the state would seek to change the federal licensing system by supporting litigation that has the potential to overturn the First Iowa decision of the U.S. Supreme Court.

PLAN IMPLEMENTATION

Legislative Action

No state legislative action is required.

Administrative Action

A hydropower coordinating committee will be established to facilitate the recommended consultation process, and to develop and review proposals to amend the Federal Power Act or overturn the First Iowa decision. The

committee will be composed of representatives of water management agencies, hydropower producers, and key public interest groups.

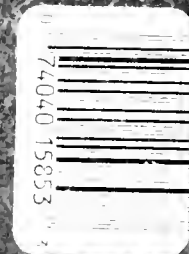
Financial Requirements and Funding Strategies

It is anticipated that the proposed administrative actions can be accommodated under current-level funding for the state water planning program. If new, detailed information is needed to intervene in a federal licensing proceeding, additional costs might be incurred.

Time Schedule

Activity	Responsibility	Deadline
A. Development and Implementation Tasks		
1. Establish coordinating committee (CC)	DNRC	March 1989
2. Develop state consultation process	DNRC and CC	June 1989
3. Define SWP process to analyze proposed hydropower projects	DNRC	September 1989
B. Ongoing Tasks		
1. Monitor FERC licensing activities	DNRC	
2. Intervene in FERC licensing proceedings	DNRC and CC	
3. Promote negotiations with appropriate hydropower licensees	DNRC	
4. Review proposed amendments to FPA for adequacy	DNRC	
5. Monitor congressional actions relating to FERC	DNRC	
6. Monitor all litigation related to FERC and state water management	DNRC	

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